



CENT Series Biomass Centrifuge

Models: USA-CENT-20, USA-CENT-45



Safety Precautions and Explanations

At USA Lab, safety is our number one priority. The following information provides guidelines for safety when using USA Lab equipment. Any piece of machinery can become dangerous to personnel when improperly operated or poorly maintained. ALL employees operating and maintaining USA Lab equipment should be familiar with its operation, thoroughly trained, and Instructed on the best safety practices.

Most industry accidents are preventable through safety awareness.

Training

It is the responsibility of the customer to ensure that all personnel who will be expected to operate or maintain the equipment. Participate in training and instruction sessions to become trained operators. All personnel operating, inspecting, servicing, or cleaning this equipment must be properly trained in the operation and machine safety. **BEFORE** operating this equipment, read the operating instructions in this equipment manual. Become thoroughly familiar with the machinery and its controls.

Safety

- Never leave the equipment running unattended and use this equipment only for its intended purpose.
- Ensure that all power sources are turned off when the machine is not in use. This encompasses electrical and pneumatic power.
- Read the manual for any special operational instructions for each piece of equipment. All USA Lab authored manuals are typically included with each device as well as posted online.
- Know how the equipment functions and understand the operating and halting processes.
- Wear the appropriate personal protective equipment for the task.
- When working on or around all equipment, avoid wearing loose clothing, jewelry, unrestrained long hair, loose ties, belts, scarves, or articles that may be caught in moving parts. Keep all extremities away from moving parts. Entanglement can cause severe bodily injury or death.
- For new equipment, check input voltage and compare with the equipment voltage rating. DO NOT supply the incorrect power to any equipment for any reason whatsoever. Electrical specifications for your machine are printed on the machine tag. A properly grounded receptacle is required for safe operation regardless of voltage requirements.
- Keep the equipment operating zone free of obstacles that could cause a person to trip or fall toward an operating machine. Keep fingers, hands, or any part of the body out of the machine and away from moving parts when the machine is operating.
- Any machine with moving parts and/or electrical components can be potentially dangerous no matter how many safety features it contains. Stay alert and think clearly while operating or servicing the equipment. Be aware of operations and personnel in your surroundings. Be attentive to indicator lights, warning lights, and/or operator interface screens displayed on the machine and know how to respond.
- Do not operate machinery if you are fatigued, emotionally distressed, or under the influence of drugs or alcohol.
- Know where the FIRST AID SAFETY STATION is located.
- Know where the FIRE EXTINGUISHING EQUIPMENT is located.
- Never sit or stand on the machine or on anything that might cause you to fall against the machine.
- Rotating and moving parts are dangerous. Keep clear of the operating area. Never put any foreign object into the operating area.
- Use proper lifting and transporting devices for heavy equipment. Some types of equipment can be extremely heavy. An appropriate lifting device should be used.
- Use caution when moving portable equipment. In some cases, the machinery can be heavy and/or may be top heavy. Portable equipment can gain momentum during transporting and must always be controlled.

Symbols and Warnings

Below are examples of commonly used symbols and what they mean.

Understand them and their potential consequences.



High Voltage or Electrical Hazard



Explosive Hazard



Not User Serviceable



Flammable Hazard



Hot Surface or Steam Hazard

Disclaimer

1. Please ensure that the unit is not being used for purposes other than what is outlined in this manual.
2. Do not use the centrifuge with caustic or corrosive substances.
3. Do not use the centrifuge outside of nominal operating parameters.
4. Do not modify the centrifuge in any way. Modification **will** void any warranties.
5. Do not allow untrained personnel to operate the centrifuge.
6. Immediately stop use when the unit has a malfunction. Investigate **all** systems thoroughly.
7. Do not hit the basket for any reason.
8. Do not overload the basket.
9. The centrifuge should be checked regularly to ensure that the centrifuge's functions, parts, and safety protection measures are in normal working condition.

USA Lab, inc. is not responsible for damages or harm incurred by using this device. Whether by willful or non-willful neglect. The owner of this device accepts all forms of liability by use of this product.

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1 Product Description

USA-CENT series centrifuges are used for extracting and filtering plant biomass compounds. This series of centrifuge extracts the active ingredients in plants through a programmable interface. It can be effectively operated by a single user.

The centrifuge features an enclosed structure, a PTFE lid seal, simple operating interface, explosion-proof motor, frequency converter, and PLC control system.

The centrifuge is constructed on a movable platform, the operation touchscreen is installed on a separate rolling stand. Featuring a gas cylinder-assisted explosion-proof glass cover. The main bearing uses multiple seals and has a leak indication port. If there is a leak, it will be visible from the indication port, it means that the upper seal has failed and needs to be replaced as soon as possible.

A biomass extraction centrifuge is primarily used to **separate a solvent (like ethanol) from plant biomass** after the solvent has absorbed desired compounds. Here are the key use cases:

Cannabis & Hemp Processing - Extracting CBD and THC oils from cannabis/hemp biomass

Pharmaceutical & food production - separating fermentation broths and active ingredients

Algae harvesting - collecting algae cells for biodiesel or high-value compounds

Biodiesel production - separating biomass from fuel feedstocks

1.1 Technical Parameters

- USA-CENT-20

Material Capacity: 30 lbs.

RPM: 1500

Motor Wattage: 4 kW @240V 3-phase

Ethanol Volume: 105L

Jacket Volume: 21L

Jacket Surface Area: 0.77 m² (27.2 ft²)

Crated Size: 160cm x 80cm x 140cm (63" x 31.5" x 55")

Weight: 520kg (1,147 lbs.)

- USA-CENT-45

Material Capacity: 50 lbs.

RPM: 1250

Motor Wattage: 5.5 kW @240V 3-phase

Ethanol Volume: 175L

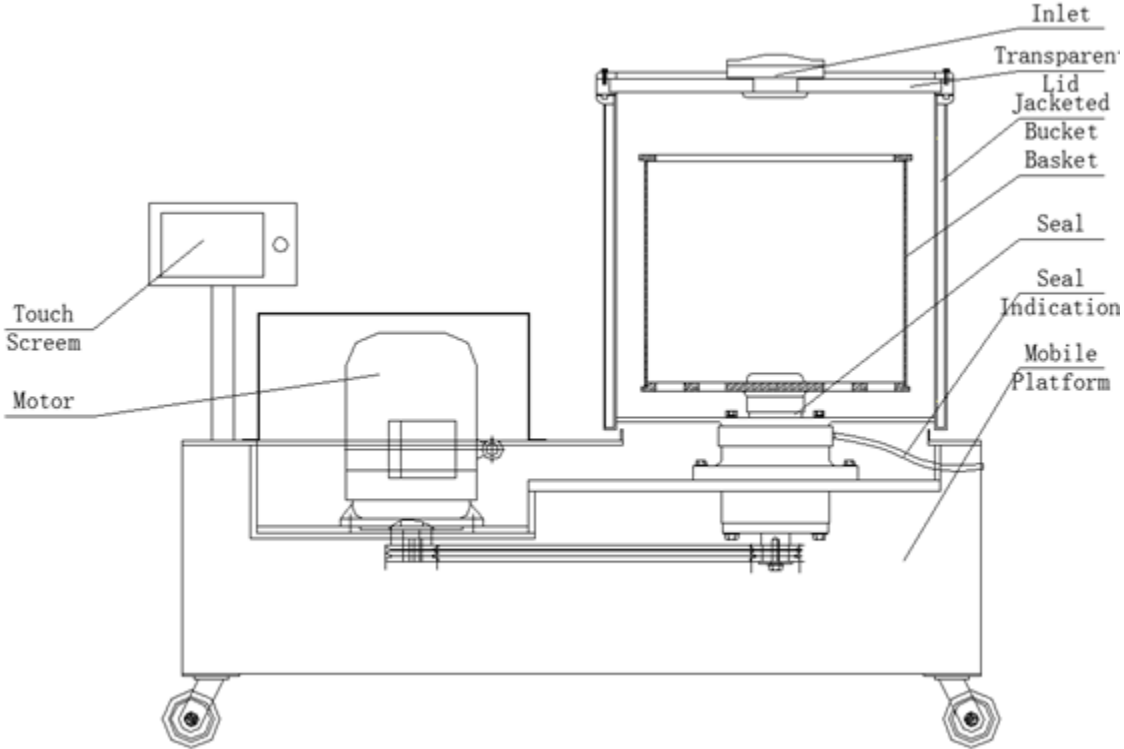
Jacket Volume: 28L

Jacket Surface Area: 1 m² (35.3 ft²)

Crated Size: 180cm x 106cm x 145cm (70.9" x 41.7" x 57")

Weight: 850kg (1,874 lbs.)

1.2 Internals Diagram

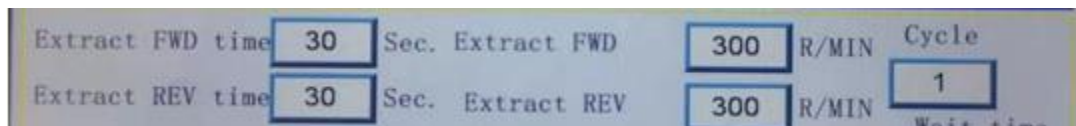


2 Operating Principles

The operator fills the filter bag with crushed plant material and places it in the machine. Evenly distributing all material.

Then, alcohol is added until the plant material is submerged.

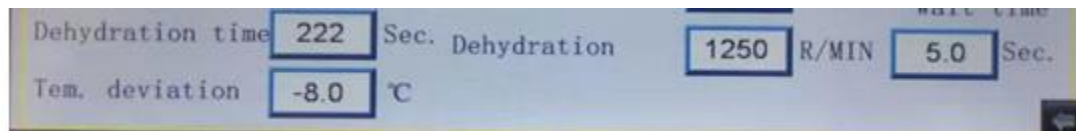
Using the "EXTRACT" area, program the desired settings. *Do NOT set the RPM higher than 300*



Open the bottom valve to empty the solution from the basket.
(Must be empty for the spin cycle to operate correctly)

Then, the plant material is spun at high speed to remove the extracted compounds.

Using the "DEHYDRATION" area, program the desired settings.



Additional rinses can be used to remove all remaining compounds. Simply repeat the above.

3 Operating Environment

Temperature: 5°C to 40°C

Area: Clean indoor location away from any corrosive / caustic solutions

Humidity: 85% RH or lower, non-condensing

Handling Notes:

The centrifuge has 4 lifting lugs. Keep the unit level at all times during lifting and use.

Long-term Storage:

Temperature: 5°C to 40°C

Area: Clean indoor location away from any corrosive / caustic solutions

Humidity: 85% RH or lower, non-condensing

Contents: The unit should be completely emptied and cleaned before storing.

Belt longevity: If possible, rotate the basket 2 turns every 3 months.

4 Preparing for Installation

Before the centrifuge is installed and used, it must be peer reviewed to ensure the integrity of the centrifuge and the facility operations. Before operation, the owner should understand the technical specifications and installation of the centrifuge. If any questions arise, please contact us.

The centrifuge must be installed horizontally, on a flat, level surface. (Tolerance $\pm 0.1''$)

Keep the area around the centrifuge clear and unobstructed. At least 3 feet of space around all sides.

Vertical space should be clear and unobstructed. At least 6 feet of space vertically.

Do not use reducers on the drain port of the unit.

The unit will vibrate. Please ensure that the unit is isolated and the hoses are flexible.

Ensure all connections are tight and leak-free.

Do not use with 208V 3-phase electrical supply. Only use 240V 3-phase electrical supply.

Ensure the electrical supply equipment is rated for the current load and adheres to local electrical code.

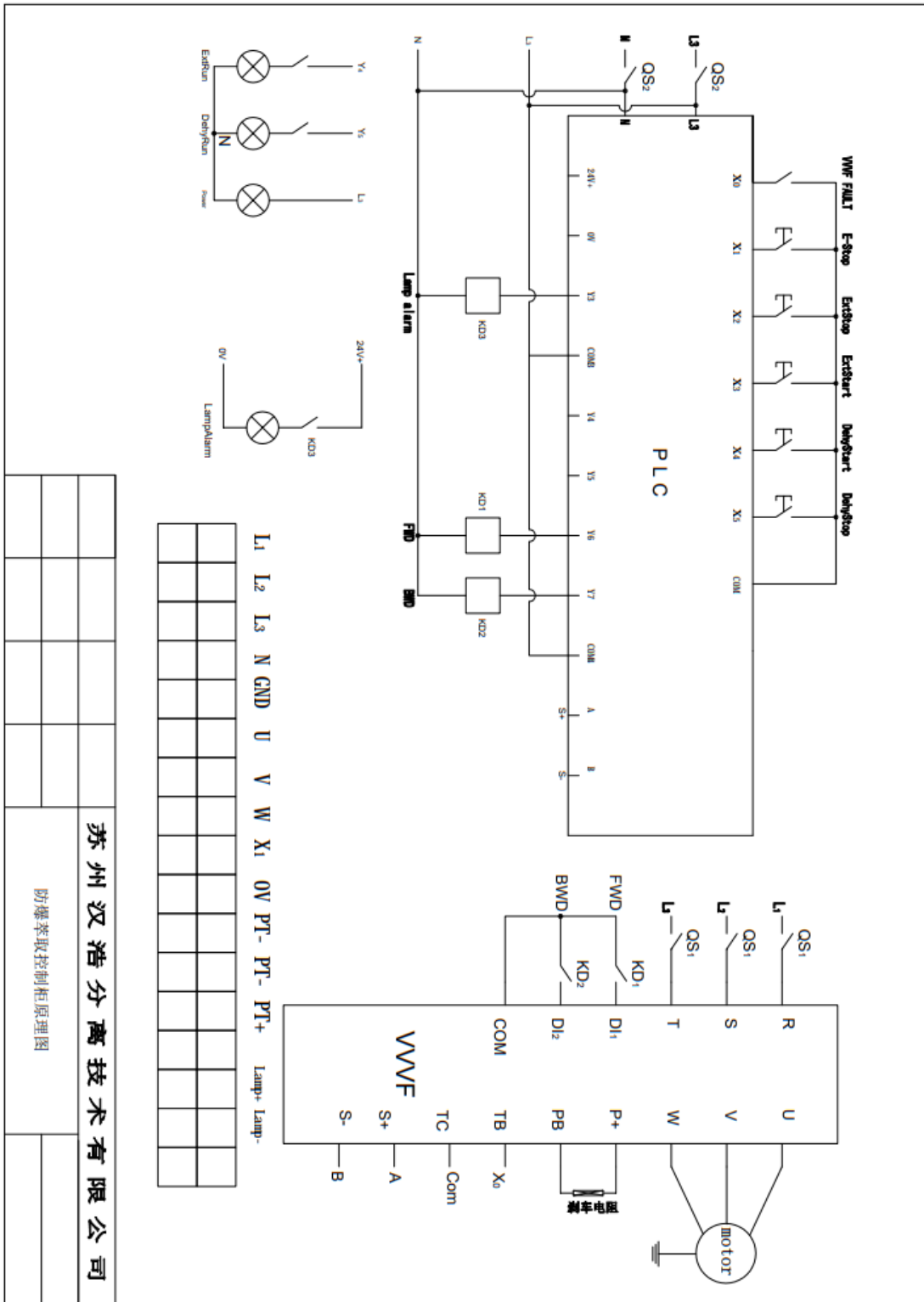
Properly ground (earth ground) the motor to prevent potentially hazardous conditions.

RPM lower than 50 is not acceptable and will cause damage to the unit.

Do not exceed the rated RPM. This can cause damage to the unit and personnel.

5 Installation Instructions

Please contact an electrician to connect the unit to a properly rated electrical system.



6 Operation

Preparation before starting:

Clean the work place before use to eliminate the obstacles and check the following parts.

Turn the drum by hand, there should be no binding or locking.

The bolts in all parts should be tight.

Ensure the filter bag meets the dimensional requirements and is free of damage.

The lid should operate normally, without any damage to the glass or ports.

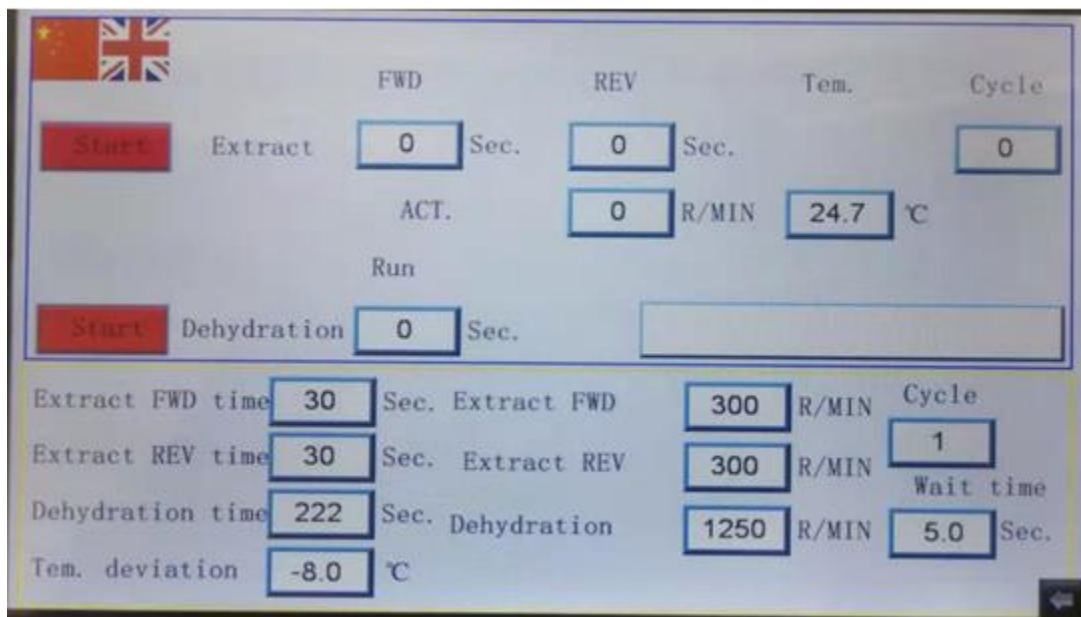
Check all fluid connections for leaks and/or pinched tubing.

6.1 Startup and Operation

1 Turn on the power:

Turn on the power inside of the control cabinet and the display.

The unit will boot up and display the preset parameters. (As seen below)



(The blue area of the display is the live readout, the yellow area is the parameter setting area.)

2 Load the basket:

The material is now loaded into the filter bag. Open it and verify that the biomass is evenly distributed inside.

3 Close the lid:

Close the upper glass lid of the centrifuge basket. Hook the U-shaped buckles over the tabs and then use the handles to secure the buckles.

4 Add extraction solvent:

Open the feed pipe valve to fill the basket of the centrifuge. Do not allow the solvent to overflow.

5 Set the parameters:

Touch the blue boxes to modify the settings on the display in the yellow windowed area.

General defaults:

- Extract FWD time: 60 Seconds
- Extract FWD speed: 200 RPM
- Extract REV time: 60 Seconds
- Extract REV speed: 200 RPM
- Cycle: 5 times
- Dehydration time: 300 Seconds (5 minutes)
- Dehydration speed: Maximum speed of the model (see section 1.1) (Do not set above rated RPM)
- Wait time: 30 seconds

6 Start the extraction process:

Press the red “Start” button in the blue window area of the display, next to the word “Extract”. Then wait for the cycle to end.

7 Drain the solvent:

Open the drain valve and discharge the solvent into an appropriately sized container. Or, if using a transfer pump, begin pumping the solvent. Once emptied, close the drain valve.

8 Dehydration cycle:

Press the red “Start” button in the blue window area of the display, next to the word “Dehydration”. Then wait for the cycle to end.

9 Drain the solvent:

Open the drain valve and discharge the solvent into an appropriately sized container. Or, if using a transfer pump, begin pumping the solvent. Once emptied, close the drain valve.

10 Empty the basket:

After the unit has drained completely, remove the filter bag carefully. It will be heavier than when it was loaded. Take care not to damage or dirty the filter bag. Close the lid.

- After use, wait until the inverter display (located on the power cabinet) shows 0 before turning off the power.

6.2 Post Extraction Checks

Check the leak indication port for traces of solvent.

Check that all connections are tight and leak free.

Check for any loose bolts or damage to the unit.

Check for residual solvent, if present, rinse with fresh solvent.

Check the basket rotation. Feel for binding or locking.

If the unit is done being used for the day, ensure power has been turned off.

Check that the glass lid is closed.

7 Maintenance

If there is any traces of solvent in the leak indicator port, please replace the upper bearing seal before continuing operation. Failure to do so will cause further damage to the bearing, requiring complete replacement.

The spin-up (start) time and spin-down (brake) time are set inside the inverter. The user can make adjustments according to their needs, but it must be set by a trained professional. Do not make adjustments without contacting us. The warranty can be voided by modifying the parameters incorrectly. Damage can be caused by setting the spin-down time lower than the spin-up time.

8 Troubleshooting

Fault	Fault location	Cause	Elimination method
Abnormal vibration	Drum parts	Uneven loading	Stir the extracted materials to make the filling even
		The filter cloth (bag) is damaged or does not fit well and leak material, causing the drum to lose balance	Reattach the filter cloth (bag) or replace the patch
	Spindle components	Spindle bearings are severely worn or damaged	Replace bearing
		Spindle nut loose	Tighten nut
	Frame parts	The base is not installed horizontally or the anchor nut is loose	Adjust the level and tighten the anchor nut
		Damaged shock absorber	Replace shock absorber
Unusual noise		Each transmission component is loose	Tighten loose parts
Leakage		Seal aging	Replace the seal
Too much feed or too much liquid in the filter cake	Filter cloth (bag)	Improper selection of filter cloth (bag), The filter cloth (bag) is damaged or does not fit well	Select the appropriate filter cloth (bag) according to the nature of the material to repair and replace the filter bag
Starting current is too large Abnormal motor heating	transmission	Defective motor	Repair or replace the motor
		Loading exceeds the quota	Load according to rated quantity
		Loose, detached or damaged parts	Fasten replacement parts