



WESTERN STATES

*where **innovation** happens everyday™*



High-Performance Filtering Centrifuges



Western States Chemical Process Division



Filtering Centrifuges are the **most versatile and cost effective method for separating solids and liquids** and offer many advantages over other types of solid/liquid separation methods. Filtering Centrifuges can process a wide range of viscosities and solids content, and are capable of removing most unbound moisture without thermal processing. Filtering centrifuges are compact, reliable and economical. Western States has over 90 years of experience providing separation solutions, process assistance and custom engineered designs.

Filtering Centrifuge Overview:

- **High Separation Forces & Low Final Moisture** - Filtering Centrifuges can generate over 1,000 gravities of separation force and can remove most, if not all, unbound moisture. No level of vacuum and pressure differential can come close to this level of centrifugal force separating liquids from solids.
- **Batch Integrity & Flexibility** - Filtering Centrifuges produce highly repeatable results. Because it is a batch operation, the time of purging, washing and drying can be varied independently and without affecting the other variables.
- **Low Cross-Contamination** - Clean design and access to all internal mechanisms make Filtering Centrifuges well suited for Clean-In-Place (CIP) design and easily adapted to meet cGMP requirements.
- **Efficient Cake Washing** - Because the wash spray is applied to the cake while the basket is spinning at between 50 and 500 rpm, washing is very efficient and uses less total wash fluid. In applications wherein the solids are soluble in the wash fluid, less wash fluid translates into less product dissolved and more solids retained.
- **High Capacity & Fast Cycle Time** - Solids retention capacity per batch ranges from 0.1 ft³ to 33.3 ft³ depending on centrifuge size. High separation forces drive liquids through the cake quickly providing cycle times as low as 3 minutes.
- **Particle Size** - Filtering Centrifuges are effective for separating solids as small as 2 microns. For smaller particles or very low solids content (<1%) Western States has special Decanting Centrifuge designs available.
- **Wide Viscosity Range** - Liquids between 1 and 1,000,000 cps can be efficiently loaded and separated in filtering centrifuges. Non-flowable products can be diluted slightly to increase flowability and improve feeding.
- **High or Low Solids Content** - Filtering centrifuges can process high or low solids content products. Very low solids suspensions can be processed because the solids are filtered and collected as liquid is continuously discharged.



Decanting Centrifuge Applications:

Particles of less than 5 microns are not readily captured by standard filter cloths. For these applications a Non-Perforated Solid Bowl can be used to centrifuge the solids toward the wall of the spinning bowl while a Skimmer Tube siphons off the clarified liquid. Once sufficient solids are captured, they are removed from the bowl. Decanting Centrifuges are also very effective for capturing solids in very dilute (<1% solids) suspensions.

Comprehensive Design

Western States Filtering Centrifuges are designed first and foremost to meet customer process, operator, electrical, cleaning, maintenance and commercial requirements. Western States offers a range of standard designs and features that have evolved over many years. We recognize that most designs started as a solution to a unique process application, so we are always ready to develop special designs to meet your needs.

Every Western States Centrifuge design incorporates:

- Customer process requirements.
- Electrical and instrumentation requirements.
- 100 years of solid/liquid separation experience.
- Empirical field testing.
- Advanced solid modeling.
- Finite element analysis.
- Quality manufacturing and component selection.



Vertical Basket Centrifuge: Automatic Unloading



Quadramatic Series

Models	68	120	210	250	320	520
VOLUMETRIC CAPACITY (Ft ³)	1.9	3.5	8.9	12.5	15.7	33.3
Volumetric Capacity (liters)	54	99	252	354	445	943
Filter Surface Area (ft ²)	6.8	11.8	20.9	25.12	31.4	52
Basket RPM	1560	1450	1250	1150	1150	1000
Standard G-Force	900	900	900	900	900	850
HP (min)	10	15	20	30	40	50
HP (max)	15	20	30	50	100	200
Dimensions (inches)						
Basket Diameter	26	30	40	48	48	60
Basket Depth	12	18	24	24	30	40
Basket Cap Width	4	4	6	7	7	9
Approximate Weights (lbs)						
Link Suspension	2,000	5,000	7,000	8,000	9,000	16,000

The Quadramatic is a vertical, bottom discharging or top unloading centrifuge developed to generate up to 2,000 gravities of separation force. When operated as a filtering centrifuge, Quadramatic centrifuges can remove most if not all of the unbound moisture without the need for thermal processing to deliver a cost-effective and dependable method of separating solids and liquids for medium to full scale production.

The Quadramatic filtering centrifuge features several design components developed to produce highly dependable performance during continuous and fully automatic operation available in capacities from 1.9 ft³ to 33 ft³ in a wide range of chemical applications. Quadramatic Centrifuges are also available with EZ Load and CIP designs to meet your processing requirements.

Material Options

316 Stainless Steel — 904 Stainless Steel — DUPLEX — HASTELLOY C-22 — HATELLOY C-276 — Others

Coating Options

Halar — PTFE — Ebonite — Other

Laboratory / Pilot Scale: STM 3000

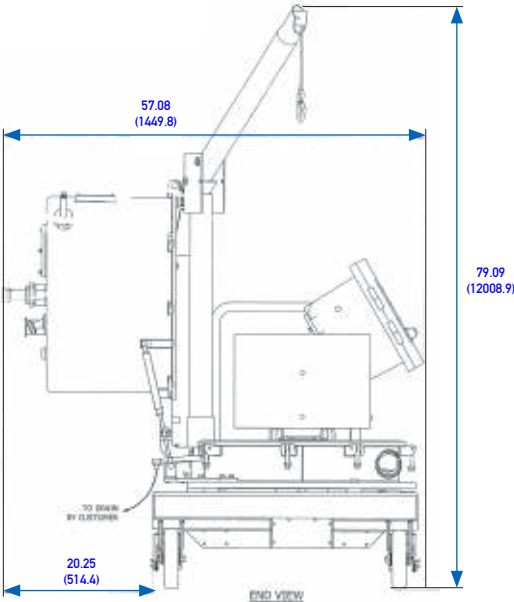
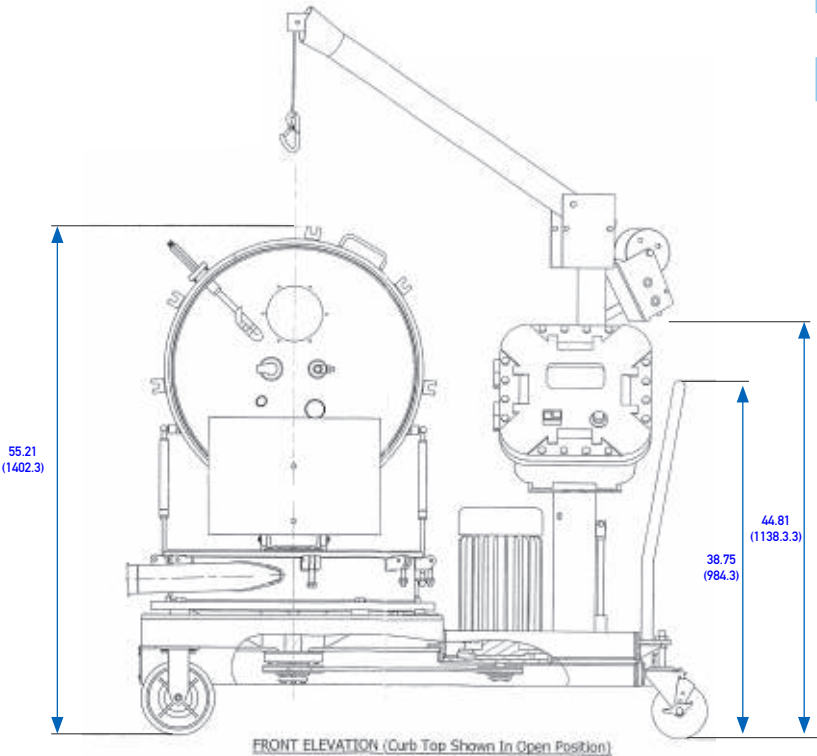


The Western States STM-3000 Top-Unloading Vertical Basket Centrifuge is the ideal solution for small scale processing.

The STM-3000 comes standard with an easy, full opening, gas, spring assisted curb top to access and remove filter screens and bags; as well as visual inspection of the centrifuge chamber. With a welded stainless steel base and heavy-duty casters, the STM-3000 is designed for easy sanitary clean-up and maneuvering.

Additionally, units come with a large 6 inch diameter curb top sight glass. With a 500 pound capacity, the manual winch provides easy extraction of filter bags and basket change outs. Motor and controls consist of variable frequency drive, start/stop buttons, speed potentiometer and digital RPM display mounted in an explosion proof NEMA 7/9 control panel.

MODEL STM 3000	Basket Size
Basket Diameter	18"
Basket Depth	12"
Basket Cap	3.25"
Basket Capacity (ft³)	1.05
Basket Capacity (liters)	29.7
Maximum Load	100 lbs.
Standard Basket RPM	2800
Maximum "G Force	2000



Laboratory / Pilot Scale: STM 2000

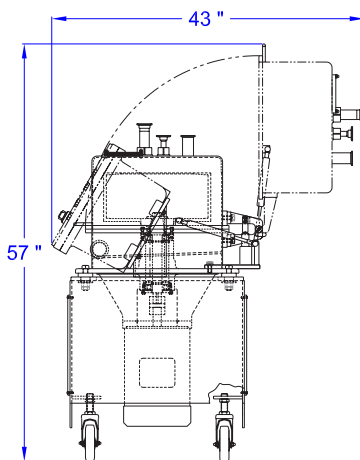
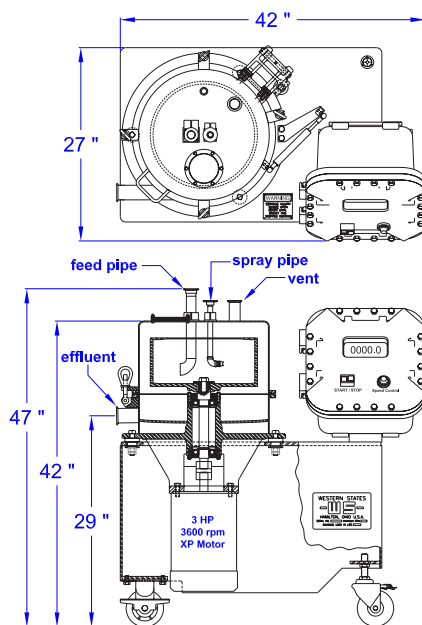


The Western States STM-2000 Centrifuge is a portable, self-contained, centrifuge that is suitable for small batch processing. The STM-2000 can be configured as a filtering centrifuge or a decanting centrifuge. The STM-2000 Centrifuge is a low cost solution for processes that require only small quantities of material and/ or are done infrequently where a full size installation is not practical. The portability of the STM-2000 allows it to be easily transported to the process area when needed and then stored out of the way when not in use.

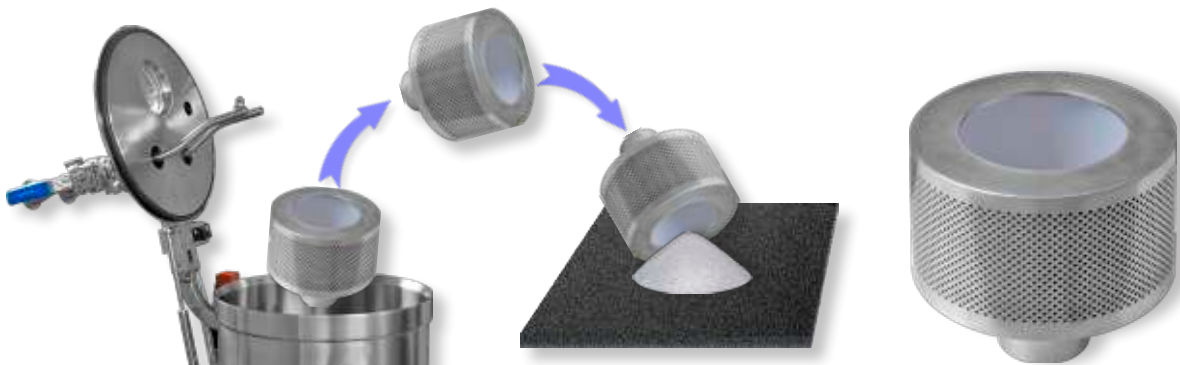
MODEL STM 2000

Basket Size

	10"	12"	14"
Basket Diameter	10"	12"	14"
Basket Depth	4"	4"	6"
Basket Cap	1.5"	2"	2"
Basket Capacity (ft ³)	0.09	0.15	0.26
Basket Capacity (liters)	2.5	4.2	7.4
Filter Area (ft ²)	0.9	1.05	1.83
Maximum Basket RPM	3600	3600	3600
Maximum "G Force	1840	2200	2600
Rental Units Available			



Laboratory Filtering Centrifuge (LFC)



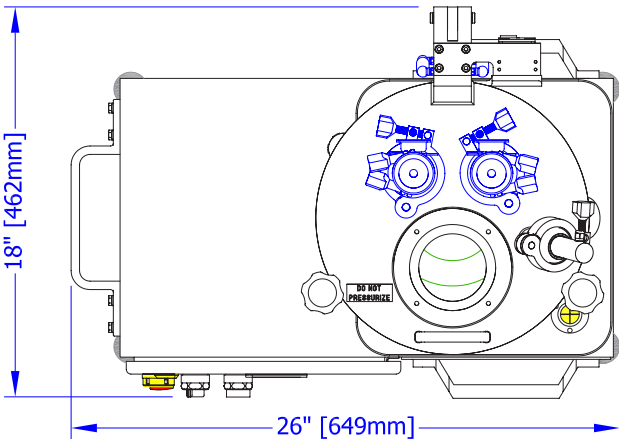
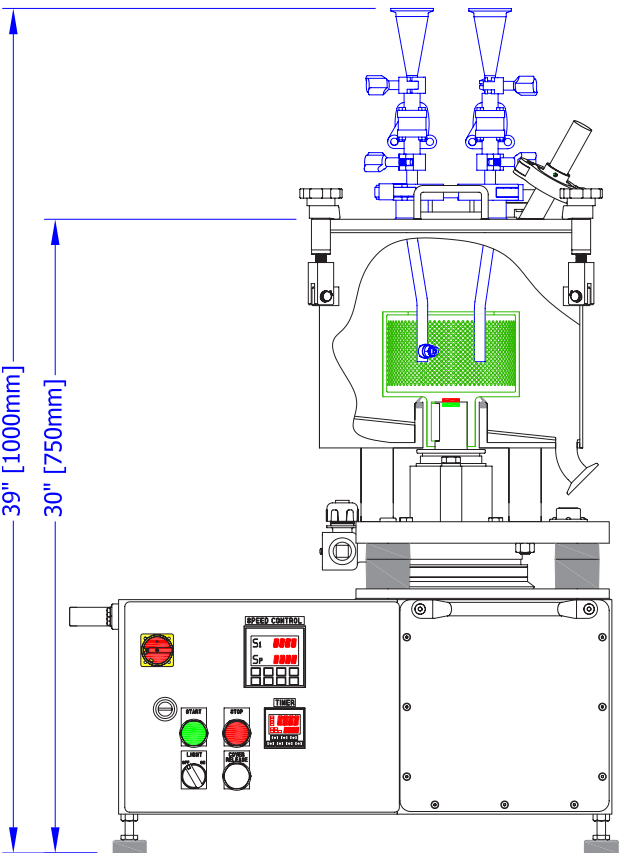
LFC Properties



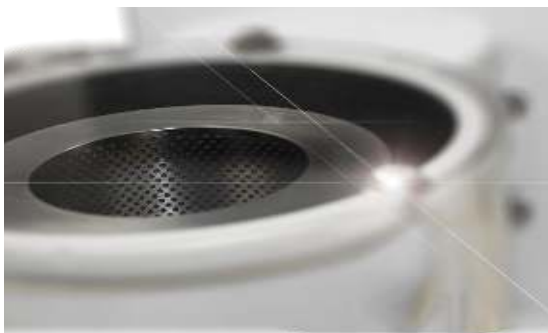
The LFC is ideal for solid-liquid separation, and extraction of food ingredients, polysaccharides, crystals, botanicals, pharmaceuticals and find cemicals. Small enough for laboratory separation work.

The ease of use and flexibility of this lab centrifuge is enhanced by the tool-less basket removal. Simply lift the basket off the shaft, carry to your workbench and recover all of the retained solids. The removable basket also allows cleaning or sterilizing of the basket. There are no cracks or crevices in the basket to trap product or microbes because the basket is machined from a solid block of stainless steel.

MODEL LFC	Basket Size
Basket Diameter	6"
Basket Depth	3.6"
Basket Cap	1"
Basket Capacity	56.5 in. ³
Basket Capacity	0.93 L
Filter Area	68 in ³
Maximum Basket RPM	5000
Maximum "G Force	2,130
Rental Units Available	



CLC-5000



CLC Properties

An Economical Lab Filtering Centrifuge

DIMENSIONS

BASKET CAPACITIES

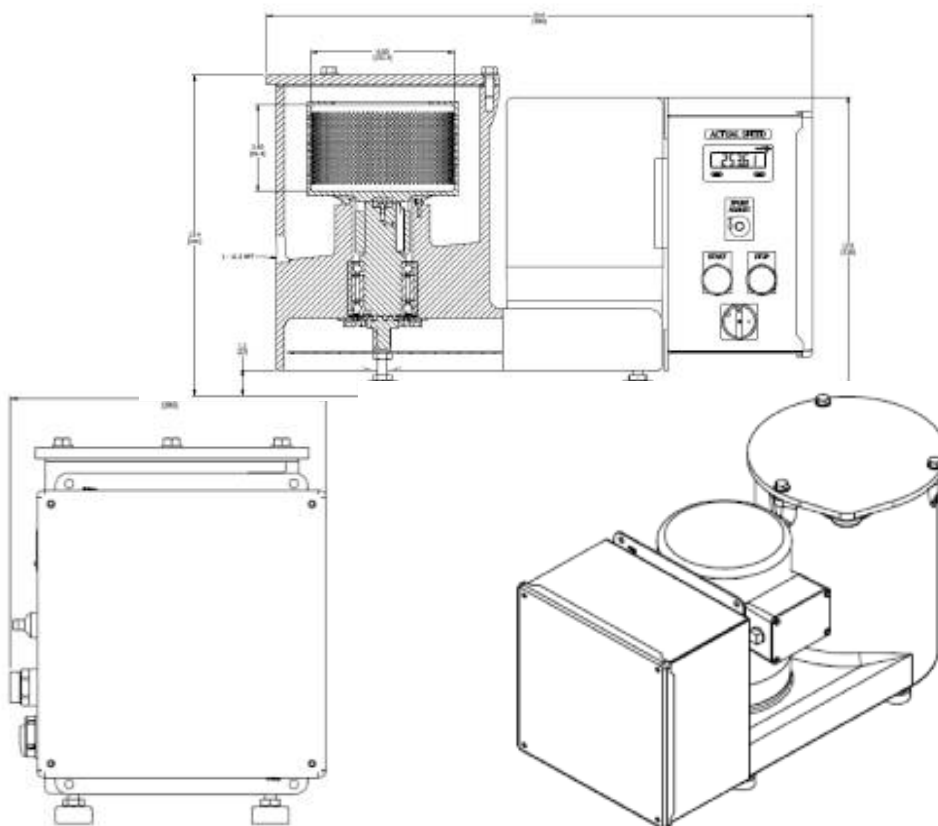
LENGTH	23 in. (58.4 cm)	VOLUME-SOLIDS CAPACITY	56.5 in. ³ (927 cm ³ , 0.93 L)
WIDTH	11.2 in. (28.5 cm)	MATERIAL OF CONSTRUCTION	316 Stainless Steel
HEIGHT	13.4 in. (34.1 cm)	BASKET SPEED	0-5,000 RPM
WEIGHT	117 lbs. (53 kg)	SEPARATION FORCE	2,130 Gravities

Rental Units Available

The CLC-5000 centrifuge features a fully viewable processing area, portability, powerful and adjustable basket speed, and 2,130 gravities of separation force. Minimize the time and labor of your skilled professionals by using the CLC-5000 for your separation needs!

The CLC-5000 offers versatility enhanced by the tool-less basket removal. Lift the basket from the machine, carry to your workbench, and recover all of the retained solids. The removable basket also allows for easy cleaning or sterilizing of the basket. The CLC-5000 will leave you with clarified liquid, dry solid cake, and greater control of the separation environment.

Design also available to meet CGMP requirements.





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