Product Overview for the Sugar Industry
The History of Western States Machine Company

Through the inventiveness and entrepreneurial spirit of Eugene Roberts, The Western States Machine Company (Western States) was founded in Salt Lake City, Utah, and incorporated April 11, 1917.

Western States customer base expanded to Canada, Peru, England, Hawaii, Mexico, Puerto Rico, Santo Domingo, Scotland, Korea and Japan. The remarkable growth of Western States was in large part due to Eugene Roberts’ early experience in the sugar mill. At age 16, Roberts was a mechanic’s helper at the Lehi Sugar Factory of Utah - only one of three independent sugar beet factories in the United States at that time. His detailed, hands-on knowledge and expertise pertaining to production and technical issues of producing sugar were priceless in contributing to the company’s influence.

Western States built its success on three principles: quality products, superior service and building relationships. Western States grew in the 20’s and 30’s, but centrifugal manufacturing had to be scaled back with the onset of World War II. Western States was awarded several contracts with the US War Department to build a variety of war-driven supplies. One of these contracts, awarded in 1942, included the development of a centrifugal which contributed to the manufacture of war chemicals – Western States first foray outside the sugar industry. As the war ended in 1945, Western States realized a boon to business primarily due to orders for spare parts and replacements. During the subsequent three years, Western States manufactured and shipped 571 centrifugals.
On September 14, 1950, Eugene Roberts died – ending a 56 year legacy within the sugar industry. Roberts’ vision continued to thrive and grow through his successors. In the 1970’s a series of Continuous Process Centrifuges were invented. Through continued innovation these designs are still being manufactured today.

In 1985, Western States manufactured the first USDA approved centrifugal, utilized to process dairy products – primarily due to its innovative designs, materials, and CIP (Clean-In-Place) System. Throughout the 80’s and 90’s Western States continued to increase sales within the food and chemical industry – many of which were developed to process crystalline materials. Additionally, the company continued to leverage technologies such as computer aided design (CAD), personal computers, and integrated computer systems to increase internal efficiency and productivity.

In 2016, Western States solidified a partnership with BIG Tecnologia and Colmena, leading manufacturers supporting the Brazilian sugar industry. BIG Tecnologia and Colmena, both Brazilian companies founded in 2003, are located in Piracicaba, Brazil, providing service and support to the sugar and ethanol industries.

With more than 6,000 centrifuges, installed across two-thirds of the globe, located in 35 plus countries, Western States is a true pioneer and driving force in the design and manufacture of centrifugals for the Sugar, Chemical and Pharmaceutical Industries. No other manufacturer in the industry can claim the same depth and level of expertise. Through state-of-the-art technology, engineering and continuous innovation, we focus on serving our customers’ needs.
The TITAN® Batch Centrifugal is designed to be a low-maintenance, efficient and cost-effective solution while providing a high return on investment for the end-user. Maintenance is reduced by minimizing the number of moving parts and the use of high strength alloys and non-metallic, food grade, components. The latest variable frequency drive technology and PLC controls ensures efficient operation with low power consumption. The TITAN® Batch Centrifugal is available in capacities from 1400 Kg to 2400 Kg.

**Design Features**

- **Largest open area of baskets** in the market today for unsurpassed purging
- **Enclosed feed system** with anti-drip valve to prevent product contamination
- **Intelligent loading system** learns/maximizes basket fill rate every cycle
- Totally unobstructed, **downward opening basket bottom valve**
- **Discharger plow** with spring-loaded tip for efficient unloading and screen protection
- Compact and efficient **variable frequency drive**, no encoder required; motor matched to the variable frequency drive for maximum compatibility
- **Fixed wash manifold** with modern, efficient fan style nozzles
- **Disk brake** for emergency stopping
- Solid state **gyration and vibration monitoring**
- **Lowest energy cost** per ton of massecuite
- **Bearing Temperature and Vibration Monitoring** available on drive heads
# TITAN Batch Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Basket Size</th>
<th>RPM (Nominal)</th>
<th>Actual Volume</th>
<th>Static Volume (Kg/charge)</th>
<th>Dynamic Volume* (pre-purge) (Kg/charge)</th>
<th>Maximum Cycles/Hour</th>
<th>Hourly Rate</th>
<th>Basket % O.A.</th>
<th>No. Holes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1400</td>
<td>54´ x 40´ x 9.0´</td>
<td>1140</td>
<td>29.5 ft³</td>
<td>1269</td>
<td>1421</td>
<td>30</td>
<td>42.6 MTPH</td>
<td>3.64%</td>
<td>3234</td>
</tr>
<tr>
<td></td>
<td>1372 mm x 1016 mm x 229 mm</td>
<td></td>
<td>0.84 m³</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1600</td>
<td>57´ x 40´ x 9.5´</td>
<td>1100</td>
<td>32.8 ft³</td>
<td>1410</td>
<td>1579</td>
<td>30</td>
<td>47.4 MTPH</td>
<td>3.63%</td>
<td>3402</td>
</tr>
<tr>
<td></td>
<td>1448 mm x 1016 mm x 241 mm</td>
<td></td>
<td>0.93 m³</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1700</td>
<td>57´ x 43´ x 9.5´</td>
<td>1100</td>
<td>35.3 ft³</td>
<td>1518</td>
<td>1700</td>
<td>30</td>
<td>51.0 MTPH</td>
<td>3.65%</td>
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<td>1448 mm x 1092 mm x 241 mm</td>
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<td>1.00 m³</td>
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<tr>
<td>1900</td>
<td>60´ x 45´ x 9.625´</td>
<td>1080</td>
<td>39.7 ft³</td>
<td>1707</td>
<td>1912</td>
<td>30</td>
<td>57.4 MTPH</td>
<td>3.63%</td>
<td>4032</td>
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<tr>
<td></td>
<td>1524 mm x 1143 mm x 244 mm</td>
<td></td>
<td>1.12 m³</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2200</td>
<td>66´ x 45´ x 10´</td>
<td>1035</td>
<td>45.8 ft³</td>
<td>1969</td>
<td>2205</td>
<td>28</td>
<td>61.7 MTPH</td>
<td>3.66%</td>
<td>4464</td>
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<tr>
<td></td>
<td>1676 mm x 1143 mm x 254 mm</td>
<td></td>
<td>1.30 m³</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2400</td>
<td>72´ x 45´ x 10´</td>
<td>1000</td>
<td>50.7 ft³</td>
<td>2180</td>
<td>2442</td>
<td>28</td>
<td>68.4 MTPH</td>
<td>3.64%</td>
<td>4848</td>
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<tr>
<td></td>
<td>1829 mm x 1143 mm x 254 mm</td>
<td></td>
<td>1.44 m³</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

*12%  
**NOTES:** Final results will depend on machine options, type of sugar, process conditions and quality of massecuite

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## TITAN BATCH CENTRIFUGALS

**OVERALL DIMENSIONS**

<table>
<thead>
<tr>
<th>Model</th>
<th>Floor to Top of Motor (A)</th>
<th>Floor to Bottom of Discharge Chute (B)</th>
<th>Footprint (C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1400</td>
<td>143.4´(3642.36 mm)</td>
<td>32.3´(820.42 mm)</td>
<td>72´ x 72´ (1828.8 mm x 1828.8 mm)</td>
</tr>
<tr>
<td>1600</td>
<td>143.4´(3642.36 mm)</td>
<td>32.3´(820.42 mm)</td>
<td>72´ x 72´ (1828.8 mm x 1828.8 mm)</td>
</tr>
<tr>
<td>1700</td>
<td>143.4´(3642.36 mm)</td>
<td>35.3´(896.62 mm)</td>
<td>72´ x 72´ (1828.8 mm x 1828.8 mm)</td>
</tr>
<tr>
<td>1900</td>
<td>163.81´(4160.77 mm)</td>
<td>35.44´(900.176 mm)</td>
<td>75´ x 75´ (1905 mm x 1905 mm)</td>
</tr>
<tr>
<td>2200</td>
<td>169.76´(4311.90 mm)</td>
<td>35.44´(900.176 mm)</td>
<td>80.5´ x 80.5´ (2044.7 mm x 2044.7 mm)</td>
</tr>
<tr>
<td>2400</td>
<td>181.45´(4608.83 mm)</td>
<td>35.44´(900.176 mm)</td>
<td>87´ x 87´ (2209.8 mm x 2209.8 mm)</td>
</tr>
</tbody>
</table>
The Roberts® G-16 LINC Batch Centrifugal has many advantages over your existing G-8 style batch centrifuge by incorporating modern components borrowed from the latest technology of the TITAN® Batch Centrifuges. This machine is designed to fit in the structural steel of your existing G-8, effectively cutting the cost of building a new structure, linking the footprint of the past to the technology of today!

**Downward opening spring basket valve** which allows for unobstructed sugar discharging

**Duplex stainless steel ringless baskets** take less time to inspect

**RD-3 Discharger** robust design for minimal sugar loss

**Increase capacity** of the larger ringless baskets

<table>
<thead>
<tr>
<th>Model</th>
<th>Basket Size</th>
<th>RPM (Nominal)</th>
<th>Actual Volume</th>
<th>Static Volume (Kg/charge)</th>
<th>Dynamic Volume* (pre-purge) (Kg/charge)</th>
<th>Maximum Cycles/Hour</th>
<th>Hourly Rate</th>
<th>Basket % O.A.</th>
<th>No. Holes</th>
</tr>
</thead>
<tbody>
<tr>
<td>900</td>
<td>50.75 x 30 x 8.38</td>
<td>1140</td>
<td>19.4 ft³</td>
<td>834</td>
<td>934</td>
<td>28</td>
<td>26.2</td>
<td>3.63%</td>
<td>2272</td>
</tr>
<tr>
<td></td>
<td>1289 mm x 762 mm x 213 mm</td>
<td></td>
<td>0.55 m³</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1100</td>
<td>50.75 x 36 x 8.38</td>
<td>1140</td>
<td>23.2 ft³</td>
<td>997</td>
<td>1117</td>
<td>28</td>
<td>31.3</td>
<td>3.64%</td>
<td>2736</td>
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<tr>
<td></td>
<td>1289 mm x 914 mm x 213 mm</td>
<td></td>
<td>0.66 m³</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1400</td>
<td>54 x 40 x 9.5</td>
<td>1140</td>
<td>29.5 ft³</td>
<td>1269</td>
<td>1421</td>
<td>28</td>
<td>39.8</td>
<td>3.63%</td>
<td>3234</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*12% NOTES: Final results will depend on machine options, type of sugar, process conditions and quality of massecuite
### Original G-8 to G-16 LINC Maintenance Comparison

<table>
<thead>
<tr>
<th>System</th>
<th>Original G-8</th>
<th>G-16 LINC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td>Oil lubrication system</td>
<td>Grease lubricated</td>
</tr>
<tr>
<td></td>
<td>Mechanical brake each cycle - brake wear</td>
<td>VFD used to slow machine during operation</td>
</tr>
<tr>
<td></td>
<td>Mechanical micro switch for gyration sensing</td>
<td>Electronic proximity switch for gyration sensing</td>
</tr>
<tr>
<td>Basket</td>
<td>Ringed – more time consuming for basket inspection</td>
<td>Ringless – higher capacity; less inspection time</td>
</tr>
<tr>
<td>Discharger</td>
<td>Narrow shoe tip for discharging</td>
<td>Wider plow blade for faster discharging times</td>
</tr>
<tr>
<td></td>
<td>(N-11) Air and pressure switches for control</td>
<td>(RD-3) Electronic proximity switches for control</td>
</tr>
<tr>
<td></td>
<td>Basket direction must be reversed to discharge</td>
<td>No reversing to discharge – saves cycle time</td>
</tr>
<tr>
<td>TurnTork</td>
<td>TurnTork required for reverse operation</td>
<td>TurnTork is eliminated</td>
</tr>
<tr>
<td>Basket Valve</td>
<td>Valve operator mounted in the basket, must be</td>
<td>Valve operator mounted above the curb top, easy</td>
</tr>
<tr>
<td></td>
<td>removed to adjust</td>
<td>access for simple adjustments</td>
</tr>
<tr>
<td></td>
<td>Air opened, gravity shut</td>
<td>Air opened, spring shut</td>
</tr>
<tr>
<td></td>
<td>Bolted two piece valve with shorter life span</td>
<td>One piece valve with very long lifespan</td>
</tr>
<tr>
<td>Gate</td>
<td>Roller or wedge style gate with complex adjustments</td>
<td>Simple butterfly valve – no adjustments and safer</td>
</tr>
<tr>
<td></td>
<td>Greased gate and water lubricated stellite</td>
<td>No routine maintenance</td>
</tr>
<tr>
<td></td>
<td>Open system – possible contamination</td>
<td>Enclosed system – cleaner</td>
</tr>
<tr>
<td>Load Control</td>
<td>Mechanical servo system with many moving parts</td>
<td>Paddle and proximity sensor system with few moving parts and simple calibration at the HMI</td>
</tr>
<tr>
<td></td>
<td>and complex adjustments</td>
<td></td>
</tr>
<tr>
<td>Electrical</td>
<td>2 speed motor with mechanical contactors</td>
<td>Standard motor with VFD control</td>
</tr>
<tr>
<td></td>
<td>Push button station with mechanical switches, no</td>
<td>Touchscreen HMI with troubleshooting and diagno-</td>
</tr>
<tr>
<td></td>
<td>information</td>
<td>stics information</td>
</tr>
</tbody>
</table>

### ROBERTS G-16 LINC CENTRIFUGALS OVERALL DIMENSIONS

<table>
<thead>
<tr>
<th>Model</th>
<th>Floor to Top of Rail (A)</th>
<th>Floor to Bottom of Discharge Chute (B)</th>
<th>Footprint (C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>900</td>
<td>98.38 (2498.9 mm)</td>
<td>11.12 (282.5 mm)</td>
<td>62’ x 62’ (1574.8 mm x 1574.8 mm)</td>
</tr>
<tr>
<td>1100</td>
<td>104.38’ (2651.1 mm)</td>
<td>11.12 (282.5 mm)</td>
<td>62’ x 62’ (1574.8 mm x 1574.8 mm)</td>
</tr>
<tr>
<td>1400</td>
<td>112.38’ (2854.3 mm)</td>
<td>11.62 (295.1 mm)</td>
<td>69’ x 69’ (1752.6 mm x 1752.6 mm)</td>
</tr>
<tr>
<td>1600</td>
<td>112.38’ (2854.3 mm)</td>
<td>11.62 (295.1 mm)</td>
<td>72’ x 72’ (1828.8 mm x 1828.8 mm)</td>
</tr>
</tbody>
</table>
The Roberts® I-SERIES Continuous Centrifugal is the most productive continuous centrifugal available. Two innovative Western States’ designs combine to provide maximum throughput with very low final molasses purity: the cast stainless steel basket with machined annular grooves for large drainage area, and the side feed system with complete massecuite conditioning.

**Design Features**

- **State of the art, centrifugally cast, stainless steel basket** with larger holes and grooves for superior purging

- **Exclusive Side Feed Design** for reduced crystal breakage and minimal purity rise (Center feed option available)

- **Multi-point internal suspension** for superior vibration isolation and reliability

- **Gentle “guide-rod” style massecuite conditioning system** minimizes crystal breakage and limits dissolved sugar

- **Best long term value** based on tons of sugar produced per hour

- **Touch screen controls** with intuitive interface

- **Simplified maintenance:**
  - Faster screen changes
  - Minimal screen segments
  - Top accessible bearing housing
  - Easy access belt tunnel
ROBERTS I-SERIES
Continuous Centrifugal 1100 | 1300

<table>
<thead>
<tr>
<th></th>
<th>1100</th>
<th>1300</th>
</tr>
</thead>
<tbody>
<tr>
<td>A, B Masseuite</td>
<td>28-36 MTPH</td>
<td>40-46 MTPH</td>
</tr>
<tr>
<td>C Masseuite</td>
<td>14-18 MTPH</td>
<td>18-22 MTPH</td>
</tr>
<tr>
<td>Motor</td>
<td>125 HP</td>
<td>150 HP</td>
</tr>
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</table>

NOTES: Final capacity results will depend on the quality of the massecuite and existing process conditions.

*Performance depends on options selected at purchase.

**MTPH is an abbreviation for Metric Tons Per Hour.

Multi-Point Suspension

The basket and bearing housing are supported internally, separate from the curb, at eight points on the TITAN-1100 and ten points on the TITAN-1300 continuous centrifugal. On some competitive machines, the entire assembly, curb and all, is supported externally. Thus, vibrations are being transmitted to the entire centrifuge and the support structure.

ROBERTS I-SERIES
CONTINUOUS CENTRIFUGALS
OVERALL DIMENSIONS

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>1100</td>
<td>107.9’ (2740.7 mm)</td>
<td>25.3’ (642.6 mm)</td>
<td>82.7’ (2100.6 mm)</td>
<td>42.5’ (1079.5 mm)</td>
<td>49.1’ (1247.1 mm)</td>
</tr>
<tr>
<td>1300</td>
<td>113.5’ (2882.9 mm)</td>
<td>25.3’ (642.6 mm)</td>
<td>82.7’ (2100.6 mm)</td>
<td>42.3’ (1074.4 mm)</td>
<td>54.8’ (1391.9 mm)</td>
</tr>
</tbody>
</table>
Our MP PUMP (Massecuite Positive Displacement Pump) is designed to handle massecuites and magmas for the Sugar Industry. The MP PUMP is perfectly suited for viscous liquid applications.

The MP PUMP’s throughput capacities range from 7m³/hour to 85m³/hour (247ft³/hour to 3001ft³/hour) at 65 rpm. Additionally, the MP PUMP is extraordinarily efficient, producing high outputs at low operating speeds – and is available in five sizes. With the ability to operate in either direction without changing stainless steel internal parts, the MP PUMP provides maximum versatility and durability.

**WHY CHOOSE THE MP PUMP?**

- Competitively priced
- Operates over long piped distances and high pressure
- Reliable performance: Extraordinarily efficient, producing high outputs at low operating speeds - and available in five sizes
- Low Maintenance: Only two moving parts! Simple maintenance of bushing and sleeve configuration results in limited downtime and servicing costs
- Durable: Sturdy design with stainless steel internal parts offers excellent corrosion wear and resistance
- Versatile: Capable of operating in either direction without changing parts
- Customizable: Technical experts help determine which motor size and configuration will work best in your facility

<table>
<thead>
<tr>
<th>MP PUMP SIZES</th>
<th>(Throughput at 65rpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>size</td>
<td>ft³/hr</td>
</tr>
<tr>
<td>MP1</td>
<td>250</td>
</tr>
<tr>
<td>MP2</td>
<td>425</td>
</tr>
<tr>
<td>MP4</td>
<td>850</td>
</tr>
<tr>
<td>MP6</td>
<td>1450</td>
</tr>
<tr>
<td>MP12</td>
<td>3000</td>
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</table>
### General Arrangement Table (mm)

<table>
<thead>
<tr>
<th></th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>A4</th>
<th>A5</th>
<th>A6</th>
<th>A7</th>
<th>A8</th>
<th>A9</th>
<th>A10</th>
<th>A11</th>
<th>A12</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP1</td>
<td>in</td>
<td>18.2 (6 Holes)</td>
<td>14.8</td>
<td>40.4</td>
<td>50.0</td>
<td>3.9 x 2 Channel</td>
<td>6.9</td>
<td>18.1</td>
<td>9.1</td>
<td>11.0</td>
<td>3.5</td>
<td>10.8</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>462.9</td>
<td>375.1</td>
<td>1025.7</td>
<td>1270.0</td>
<td>100.0 x 50.0</td>
<td>176.0</td>
<td>460.0</td>
<td>230.0</td>
<td>280.0</td>
<td>90.0</td>
<td>275.0</td>
</tr>
<tr>
<td>MP2</td>
<td>in</td>
<td>21.5 (6 Holes)</td>
<td>16.8</td>
<td>46.8</td>
<td>62.7</td>
<td>3.9 x 2 Channel</td>
<td>7.9</td>
<td>21.4</td>
<td>10.6</td>
<td>12.9</td>
<td>4.3</td>
<td>13.0</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>544.9</td>
<td>425.5</td>
<td>1189.9</td>
<td>1593.5</td>
<td>100.0 x 50.0</td>
<td>200.5</td>
<td>544.0</td>
<td>268.0</td>
<td>328.0</td>
<td>110.0</td>
<td>330.5</td>
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<tr>
<td>MP4</td>
<td>in</td>
<td>24.3 (6 Holes)</td>
<td>20.1</td>
<td>52.5</td>
<td>77.2</td>
<td>3.9 x 2 Channel</td>
<td>9.7</td>
<td>26.6</td>
<td>13.2</td>
<td>16.4</td>
<td>5.1</td>
<td>16.2</td>
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<td></td>
<td>mm</td>
<td>616.9</td>
<td>511.0</td>
<td>1333.8</td>
<td>1961.0</td>
<td>100.0 x 50.0</td>
<td>247.0</td>
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<td>336.2</td>
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<td>in</td>
<td>27.6 (6 Holes)</td>
<td>21.7</td>
<td>59.2</td>
<td>79.4</td>
<td>5.5 x 2.4 Channel</td>
<td>10.1</td>
<td>29.1</td>
<td>14.2</td>
<td>18.9</td>
<td>5.1</td>
<td>17.7</td>
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<tr>
<td></td>
<td>mm</td>
<td>701.5</td>
<td>550.0</td>
<td>1503.0</td>
<td>2016.6</td>
<td>100.0 x 50.0</td>
<td>256.9</td>
<td>740.0</td>
<td>360.5</td>
<td>480.0</td>
<td>130.0</td>
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<td>MP12</td>
<td>in</td>
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<td>21.7</td>
<td>69.1</td>
<td>88.9</td>
<td>5.5 x 2.4 Channel</td>
<td>12.4</td>
<td>30.7</td>
<td>15.6</td>
<td>19.7</td>
<td>5.5</td>
<td>17.7</td>
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<tr>
<td></td>
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<td>550.1</td>
<td>1755.3</td>
<td>2259.0</td>
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<td>315.0</td>
<td>780.0</td>
<td>395.0</td>
<td>500.0</td>
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**Massecuite Double Lobe Displacement Pumps**

**CAPACITY CHART**

**POWER CHART**

**GENERAL ARRANGEMENT DRAWING**
Machine Modernizations

Western States offers a wide range of modernization upgrades for existing centrifugals. The robust construction of the Western States centrifugal assures a life of 30 years or more.

As technology advances and new innovations are incorporated into the TITAN® centrifugals, Western States has created a line of modernizations that will allow the older Western States centrifugals to take advantage of the new technology. Upgrading existing centrifugals will increase performance, decrease spare part requirements, reduce maintenance, and greatly extend their life.

A full modernization consists of a VFD Upgrade, Load Control Upgrade, Ringless Basket Conversion, and installation of a Universal Discharger. Although we recommend all conversions to get older centrifugals operating at peak performance, each modernization can usually be purchased separately as well.

Variable Frequency Drive and Motor Upgrades

Designed specifically for 48”x 30”, 48”x 36”, and 54”x 40” batch centrifugals, the VFD Upgrade eliminates the 2-speed motor, across-the-line contactors and high-maintenance TurnTork reversing drive. These VFD’s utilize advanced Direct Torque Control (DTC) which makes 40,000 speed control corrections per second. These drives use low-speed torque control, generate significantly lower noise than other VFDs and do not require an encoder to control motor speed, which eliminates the problematic signal cable between each motor and VFD.

**Upgrade Benefits:**

- Increases production by reducing cycle time
- Active front end drive and full regenerative braking returns power to factory grid with each cycle
- Eliminates power spikes thereby reducing overall power consumption
- Encoder free operation reduces complexity and increases reliability
- Eliminates the TurnTork slow-speed reverse drive
- TEFC motor eliminates sugar dust contamination
Exclusive Western States Ringless Baskets

Increase usable basket volume without changing the 2-speed motor or other major components\(^1\)

Ringless baskets utilize the same outside diameter but larger inside diameter by eliminating steel support rings

High strength Duplex Stainless Steel\(^2\) provides superior resistance to pitting and corrosion

Provides the same high purging performance as our ringed baskets

Superior manufacturing processes and quality control

Available up to 72” diameter

No other major modifications required\(^3\)

Notes:
1. 54” baskets may require a larger motor to achieve equivalent performance.
2. Yield strength is approximately 2\(\times\) that of austenitic steel
3. Basket screens are longer but the same height and the discharger blade tip may need to be increased about one inch in length

When converting from a ringed to a ringless basket, one must consider the increase in cycle time due to the increased sugar wall thickness. If a loss of 1 cycle per hour is assumed due to increased wash time and 20 cycles per hour were achieved before the conversion, the following capacity increases can be anticipated:

- 48” x 30” Ringed to 50.75” x 30” Ringless: 368 ft\(^3\) / 313 ft\(^3\) = 17.6% increase in capacity
- 48” x 36” Ringed to 50.75” x 36” Ringless: 441 ft\(^3\) / 376 ft\(^3\) = 17.3% increase in capacity
- 48” x 30” Ringed to 50.75” x 36” Ringless: 441 ft\(^3\) / 313 ft\(^3\) = 40.9% increase in capacity
- 54” x 40” Ringed to 57.00” x 40” Ringless: 570 ft\(^3\) / 1478 ft\(^3\) = 19.2% increase in capacity
The Universal Discharger

Universal Discharger Features:

- Loosen and Rotate Cams Quickly and Easily in Four Locations
- No Need for Multiple Discharger Parts Inventories
- Can Replace Most Dischargers on G-8 Machines
- Increased Reliability with Proximity Switches

With the Universal Discharger, adjustment time is decreased from four hours to 15 minutes. Assuming a machine produces one ton of sugar per cycle with 20 cycles/hour, customers gain 3.75 hours or 75 tons of additional sugar processed – a definite plus for G-8 users.

PLC Automation

- Replaces old relay and obsolete PLC controls
- Reduces spare parts cost
- Compatible with DCS systems
- Industry standard Allen Bradley PLC with world-wide support
- Siemens and other options available
- Standard Ethernet/IP communication

Touch Screen Graphical Operator Interface

- Replaces mechanical push buttons
- Full color graphical touch screen for manual or automatic control of the centrifugal cycle
- Western States - PanelView-Plus-1000
- Set all process timers from the screen
- Control gate opening and basket fill from the screen
- Screen displays operating information throughout the cycle
- Displays diagnostic information to aid problem solving
- Requires PLC upgrade
- Allen Bradley, Siemens, C-More, and other options available
Enclosed Feeding System

Round, butterfly style, infinitely adjustable feed valve
Replaces the sliding wedge and roller wedge type loading gate
Dripping is prevented by a rugged oval shaped butterfly valve mounted on the curb top
Requires an electronic loading control

Benefits:
- Retain Stepped Feed Valve Closing
- More Precise Basket Loading
- Eliminate Costly Gate Rebuilds
- Reduce Sugar Contamination
- Reduce Splashing
- Enhance Operator Safety

Paddle Style Electronic Load Control

The Analog Feedback Mechanical Load Control is a fully enclosed, solid state device to replace the Servo Loading Control. The electronics for the Analog Feedback Mechanical Load Control assembly are located on the unit for easy access and simplified installation.

- Generates a 4 to 20 mA signal in response to changing sugar load to control the loading gate
- Retains the sequenced gate closing action to assure maximum loading of the basket
- Can be used with the sliding wedge or roller wedge loading gate

The complete package to convert a centrifugal using a sliding wedge or roller wedge gate and Servo Loading to Analog Feedback Mechanical Load Control consists of:
- Analog Feedback Mechanical Load Sensor
- Gate encoder

Optional items that may be required are:
- Electronics package
- Replacement valve lifter assembly
- Gate solenoid valves
CC Modernizations

Needle-Valve Feed System

- Replaces older style orifice plate feed system
- Changes feed rates as massecuite consistency changes without stopping the feed
- Achieves better pretreatment with the improved feed guide rod and halo steam design

Single Loop Control

- Replaces old-style PLC and relay controls
- Accurately maintains the preset basket loading as massecuite levels in the mixer change

100 HP Drive Motor

- Replaces the 75 HP drive motor of a CC-6
- Increases throughput
Each assembly sent to Western States for repair is inspected. A notification is sent upon completion of inspection with our recommendations for repair and costs associated. If assemblies are found to be irreparable, an inspection charge applies and either the parts can be returned or disposed of at our facility.

The following list includes the products that we rebuild for our customers using the same high OEM standards of quality as is received when buying new:

- G-8 Head Assembly
- G-8 Brake Assembly
- Ringed Basket Assembly
- Gate Assembly
- Discharger Assembly
- Valve Lifting Fork
- Turn Tork Assembly
- Brake Air Cylinder Assembly
- Gate Air Cylinder Assembly
- Load Control with Servo Assembly
- Straddle Valve Lifter Assembly

**G-8 Head Assembly**
48x30, G-8C, 48x36, 54x40, G-8D
- Disassemble and inspect
- Sandblast and repaint as required
- Replace all worn parts
- Check ball and seat for proper fit
- Replace rubber buffer
- Assemble and test

**Gate Assembly**
- Disassemble and inspect
- Sandblast and repaint as required
- Replace wedges
- Replace Stellite on body
- Replace springs, bushings
- Assemble and test

**Basket Assembly**
- Sandblast
- Inspect
- True-up
- Balance
OEM Parts

Western States has been supporting its customers and their centrifugals around the world since 1917 with quality parts and service. Whether your centrifugal was built in 1947 or this year, our warehouse has over 1,000,000 individual parts, from high alloy stainless steel baskets to simple spring washers. Using original quality parts from Western States will increase uptime and performance as well as reduce maintenance.

We offer:

• 24 Hour Emergency Hotline
• Replacement Parts Specialists
• Every replacement part order is checked against original specifications
• Upgraded parts are automatically shipped when an older part is ordered
• $6,000,000 parts inventory on site to provide immediate shipment of most parts
Service Technicians

Western States has a committed staff of trained and experienced commissioning personnel to assist in the installation and commissioning of new centrifuges or maintaining existing Western States centrifuges.

Commissioning support (less travel and living expenses) is provided at no expense to the customer on installation of new equipment for a pre-negotiated number of days.

Western States provides service contracts specifically designed to meet the preventive maintenance needs of the individual customer.

Preventive maintenance can save thousands of dollars in costly parts, downtime and unnecessary maintenance.

We offer:
• Dedicated Service Engineers trained in both mechanical and electrical problem solving
• Maintenance Training Seminars which can be provided at either the customer’s facility or at Western States
• Service Engineers will train both operators, mechanics, and instrument personnel regarding the operation and maintenance of a new installation
• Service Engineers are available for factory visits and inspections in as little as 24 hours