

## START-UP INSTRUCTIONS FOR CMS-J SERIES GRAIN DRYERS

### STAGED AUTOMATIC START-UP PROCEDURE

TEST OPERATE THE DRYER IMMEDIATELY PRIOR TO START-UP, TO MAKE CERTAIN ALL MOTORS AND CONTROLS ARE FUNCTIONAL BEFORE LOADING THE DRYER WITH WET GRAIN.	
SET CONTROLS	<ol style="list-style-type: none"> <li>1. Set Controls As Listed:             <ol style="list-style-type: none"> <li>A. Temporarily set all burner (plenum) thermostats at the drying temperature recommended for normal operation of the top stage burner (for example, 220-230°F for shelled corn).</li> <li>B. Set the grain column high limit thermostat 40°F below the top stage burner thermostat (for example, 190°F for shelled corn).</li> <li>C. MC Selector OFF.</li> <li>D. For start-up purposes only, set control selector on CONTINUOUS FLOW.</li> <li>E. Loaders OFF; Unloaders OFF</li> <li>F. Fans OFF; Burners OFF</li> </ol> </li> </ol>
LOAD DRYER	<ol style="list-style-type: none"> <li>2. Depress dryer START button; green indicator light should come on.</li> <li>3. Loaders ON; fill the dryer</li> </ol>
DETERMINE START-UP CYCLE TIME	<ol style="list-style-type: none"> <li>4. First, determine the approximate total drying time for the type of grain and the drying process to be used from the Drying Time Table.             <p style="margin-left: 40px;">NOTE: For example, with 25% moisture shelled corn using the DRY AND COOL process, and final desired moisture of 15% (10% removal), the estimated drying time is 60 minutes.</p> </li> <li>5. Using the total drying time from Step 4, refer to the appropriate cycle time chart for staged automatic operation and determine the normal operating cycle time.             <p style="margin-left: 40px;">NOTE: For the 60 minute drying time example mentioned earlier, the cycle time would be 23.6 minutes for the DRY AND COOL process.</p> </li> <li>6. The start-up cycle time is equal to the normal operating cycle time PLUS 3.7 minutes (3.7 minutes is the approximate unload time at 100% discharge rate).</li> </ol>
1ST START-UP CYCLE	<ol style="list-style-type: none"> <li>7. Turn BOTTOM FAN and BURNER switches ON and operate bottom stage for one start-up cycle time period, as determined in Step 6.             <p style="margin-left: 40px;">NOTE: The cycle timer may be used as a timing device by setting it to the required time, and then moving the selector switch to STAGED AUTOMATIC and observing timer operation.</p> </li> </ol>
2ND START-UP CYCLE	<ol style="list-style-type: none"> <li>8. Readjust BOTTOM STAGE drying temperature to the normal MIDDLE STAGE drying temperature (approximately 200°F for earlier examples).</li> <li>9. Turn MIDDLE FAN and BURNER switches ON and operate both bottom and middle stages for an additional start-up cycle period.</li> </ol>
NORMAL STAGED AUTOMATIC OPERATION	<ol style="list-style-type: none"> <li>10. Set selector switch to STAGED AUTOMATIC.</li> <li>11. Reset BOTTOM and MIDDLE stage drying temperatures to recommended settings (approximately 230°F for top stage, 200°F for middle stage, and 170°F for bottom stage for earlier shelled corn example).</li> <li>12. Set all controls as listed in the appropriate cycle time chart for the estimated drying time and proceed in the described staged automatic mode of operation.             <p style="margin-left: 40px;">NOTE: The cycle time settings listed are based upon a meter roll adjustment setting of 100%. This setting provides an unload time of approximately 3.7 minutes for the bottom stage. IF A LOWER DISCHARGE RATE IS REQUIRED, THE CYCLE TIME SETTING SHOULD BE REDUCED BY APPROXIMATELY THE AMOUNT OF INCREASED UNLOAD TIME.</p> </li> <li>13. Several cycles are required for final moisture content to stabilize. Check final moisture and readjust cycle time, as required.</li> </ol>

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## CONTINUOUS FLOW START-UP PROCEDURE

TEST OPERATE THE DRYER IMMEDIATELY PRIOR TO START-UP, TO MAKE CERTAIN ALL MOTORS AND CONTROLS ARE FUNCTIONAL BEFORE LOADING THE DRYER WITH WET GRAIN.

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|----------------------------------|---|
| SET CONTROLS                     | <ol style="list-style-type: none"> <li>1. Set Controls As Listed:             <ol style="list-style-type: none"> <li>A. Temporarily set all burner (plenum) thermostats at the drying temperature recommended for normal operation of the top stage burner (for example, 220-230°F for shelled corn).</li> <li>B. Set the grain column high limit thermostat 40°F below the top stage burner thermostat (for example, 190°F for shelled corn).</li> <li>C. MC selector OFF.</li> <li>D. Control selector on CONTINUOUS FLOW.</li> <li>E. Loaders OFF; Unloaders OFF.</li> <li>F. Fans OFF; Burners OFF.</li> </ol> </li> </ol>  |
| LOAD DRYER                       | <ol style="list-style-type: none"> <li>2. Depress dryer START button; green indicator light should come on.</li> <li>3. Loaders ON; fill the dryer.</li> </ol>  |
| DETERMINE START-UP CYCLE TIME    | <ol style="list-style-type: none"> <li>4. First, determine the approximate total drying time for the type of grain and the drying process to be used from the Drying Time Table.<br/>             NOTE: For example, with 25% moisture shelled corn, using the DRY AND COOL process, and final desired moisture of 15% (10% removal), the estimated drying time is 60 minutes.</li> <li>5. Using the total drying time from Step 4, refer to the appropriate cycle time chart for continuous flow operation and determine the normal drying time per stage.<br/>             NOTE: For the 60 minute drying time example mentioned earlier, the drying time per stage would be 30 minutes for the DRY AND COOL process.</li> </ol>  |
| 1ST START-UP CYCLE               | <ol style="list-style-type: none"> <li>6. Turn BOTTOM FAN and BURNER switches ON and operate bottom stage for one start-up cycle time period, as established in Step 5.</li> </ol>  |
| 2ND START-UP CYCLE               | <ol style="list-style-type: none"> <li>7. Readjust BOTTOM STAGE drying temperature to the normal MIDDLE STAGE drying temperature (approximately 180°F for the dry and cool example mentioned earlier).</li> <li>8. Turn MIDDLE FAN and BURNER switches ON and operate both bottom and middle stages for an additional start-up cycle period.</li> </ol>   |
| 3RD START-UP CYCLE               | <ol style="list-style-type: none"> <li>9. For DRY AND COOL operation, turn BOTTOM burner switch OFF. For FULL HEAT drying, keep BOTTOM burner switch ON and readjust bottom stage drying temperature to the normal recommended setting.</li> <li>10. Readjust MIDDLE stage drying temperature to the normal recommended setting.</li> <li>11. Turn TOP FAN and BURNER switches ON.</li> <li>12. Operate dryer for approximately 1/2 of the start-up cycle time, as determined in Step 5.</li> <li>13. While dryer is operating, adjust the meter roll handwheel to the recommended trial setting. To determine the setting, refer to the appropriate cycle time chart for CONTINUOUS FLOW OPERATION and determine the approximate drying capacity corresponding to the proper total drying time. Then, use this capacity and refer to the metering roll discharge chart (located at far right-hand side of chart) to determine the required initial pointer setting for the handwheel.</li> </ol> |
| NORMAL CONTINUOUS FLOW OPERATION | <ol style="list-style-type: none"> <li>14. At the end of the 3rd start-up cycle, turn unloaders control to AUTO and set all controls as indicated by the appropriate cycle time chart.</li> <li>15. Check the final moisture content and readjust the unloading rate slightly, if required.<br/>             NOTE: The time required for the grain to pass completely through the dryer is the time necessary to notice a stabilized change in final moisture content after adjustment. During start-up, some variation will naturally occur.</li> <li>16. Set MC thermostat as described in manual.</li> </ol>   |