

Inverter based out of balance (OOB) detection

Milnor Engineering details:

Specific model details

MilTouch

1. The system calculates OoB conditions during drain speed.
2. The OoB detection system compares the imbalance to a table of threshold values.
3. If the imbalance is greater than the lowest threshold value, the system limits the speed for the extract step based on the imbalance.
4. If the imbalance is less than the lowest threshold value, the extract step executes at the programmed speed.
5. The OoB detection process stops until the cylinder accelerates to drain speed again.
6. If the vibration switch trips while accelerating the cylinder to extract speed, the controller software recycles the load and repeats steps 1-6.

MilTouch-EX (Models 68036M5K , 72046M5K)

Note: Throughout any extract step, the control software monitors the excursion switch and if the excursion switch trips, the machine redistributes the load and begins from Step 1.

Intermediate Extract

1. The inverter determines the amount of imbalance within the cylinder at drain speed.
2. The OoB detection system compares the imbalance to a table of threshold values.
3. If the imbalance is greater than the lowest threshold value, the system limits the speed for the extract step to a speed based on the imbalance.
4. If the imbalance is less than the lowest threshold value, the extract step executes at the programmed speed.
5. The OoB detection process stops until the cylinder accelerates to drain speed again.

Final extract

1. The control software evaluates whether the amount of imbalance is below the threshold value for the machine.
2. If the imbalance is above the lowest threshold, the control software recycles the extract sequence up to three times. This is an attempt to achieve the greatest extract before discharging the goods.
3. If the imbalance remains above the above the lowest threshold value after the third recycle attempt, the control software limits the cylinder speed based on the imbalance.
4. If the imbalance is below the lowest threshold value, extract accelerates to the programmed speed.

MilTouch-EX (Model 72046M5K)

Note: These models use water inject into the cylinder ribs for balancing the OoB. Inverter balance detection compliments this feature to prevent extract if OoB exceeds the water balancing capacity. This saves time attempting to balance too large a OoB. Throughout any extract step, the control software monitors the excursion switch and if the excursion switch trips, the machine redistributes the load and begins from Step 1.

Intermediate Extract

1. The inverter determines the amount of imbalance within the cylinder at drain speed.
2. The OoB detection system compares the amount of imbalance to a fixed threshold value.
3. If the imbalance is greater than the fixed threshold value, the OoB detection system limits the speed to a slow speed (210 RPM) for the intermediate extract step.
4. If the imbalance is less than the fixed threshold value, the control software balances the load and performs the extract at the programmed speed.
5. The OoB detection process stops until the cylinder accelerates to drain speed again.

Final Extract

1. The control software evaluates whether the amount of imbalance can be offset by injecting water in cylinder ribs opposite the imbalance.
2. If the imbalance can be offset, the machine control software advances to the final extract step.
3. If the imbalance is too large to be offset by injecting water in cylinder ribs, the control software recycles the extract sequence up to three times.
4. If the imbalance remains above the balance threshold value after the third recycle attempt, the control software limits the cylinder speed to the fixed slow speed (210 RPM).
5. If the imbalance is less than the fixed threshold value, the control software balances the load and completes the extract step at the programmed speed.
6. The control software injects water into the cylinder ribs to offset the imbalance.
7. Completes the extract step.