

Mel Korum Family YMCA CASE STUDY

*Documented 78% energy reduction
for a savings of \$4,555 per year.*

Pierce and Kitsap County YMCA facilities in Washington State have been participating in an energy efficiency upgrade program in conjunction with their local utilities. The Mel Korum Family YMCA identified the Main Pool Filter Pump and the Spa-Hydro Filter Pump as two applications that could provide significant energy savings to the facility.

"We have just added two Flux Drive units to our pool and spa motors and pumps. When they were installed, we noticed an immediate reduction in vibration and temperatures of the motors and pumps. They are both running at lower RPM with substantial energy savings and we have also reduced the maintenance required on these two applications."

Michael Moran
Facility Manager, Mel Korum Family YMCA

Whitney Purvis
Facilities Tech, Mel Korum Family YMCA

Mel Korum Family YMCA Installs Flux Drive Adjustable Speed Drives— Energy Savings Qualified for 70% Energy Grant from Puget Sound Energy

Challenge

The two motor-pump applications at the Mel Korum Family YMCA use the same 15hp (1750 rpm) motors and Paco (4X5X9) pumps. The Main Pool Filter pump was originally set to run at a constant speed with a corresponding flow rate of 520 GPM and energy consumption measured at 10.2 kW. An analysis determined that the flow rate could be reduced by 50% (260 GPM) for 23hrs a day and then increased to full speed for the hour needed to complete the backwash cycle.

The Spa-Hydro Pool pump application also ran at full speed; however, it was throttled back with a valve to maintain 160 GPM flow rate to the pool. It was calculated that energy savings could also be realized by reducing the pump speed and eliminating the use of the throttle valve to reduce the flow.

Solution

The energy savings for both of these applications was achieved by slowing down the speed of the pump to control the water flow to the pools. This is explained by the Affinity Laws for centrifugal pumps as follows:

- 1) *The change in flow is proportional to the change in pump speed.*
- 2) *The change in energy use is proportional to the cube of the change in pump speed.*

To slow down the YMCA pumps, a Flux Drive adjustable speed drive (ASD) with a manual Joyce actuator was selected for both installations. Since the pumps did not require continuous speed control, a manual actuator was determined to be the most cost effective solution for the job.

For both applications, the original motor to pump shaft distance with a Love Joy flexible coupling installed was 4 inches. This required that the motor be moved back 8 inches to accommodate the Flux Drive ASD (Model 08-45). The foundations were extended to allow the Flux Drive ASD to be installed between the motor and the pump.

Once the installations were complete, the Flux Drive team started the motor and repeated the power and condition readings for each of the new Flux Drive adjustable speed installations. Overall energy savings and vibration/noise levels on the two motor and pump applications were notably reduced.

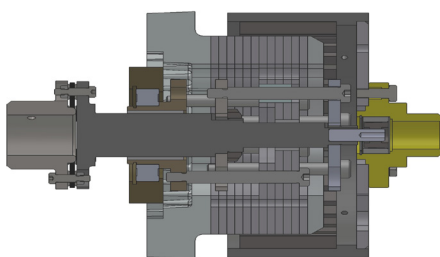


Flux Drive ASD with Manual Speed Control



ENERGY EFFICIENCY MADE EASY

Flux Drive Inc. designs and manufactures permanent magnet adjustable speed drives and couplings that increase the life and performance of rotating equipment. The company's patented technology greatly lowers power requirements and extends the life of motor driven systems by allowing motors to run at constant speed while the Flux Drive provides soft starting and adjustable speed. Flux Drive products have been proven to reduce system maintenance costs and offer substantial energy savings.

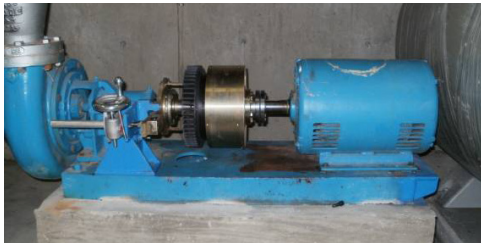


Flux Drive Adjustable Speed Drive

Mel Korum Family YMCA Case Study



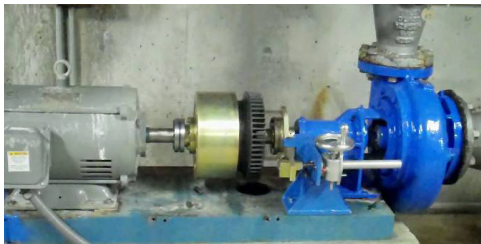
Main Pool Pump: Original Application



Main Pool Pump: Flux Drive Application



Spa-Hydro Pump: Original Application



Spa-Hydro Pump: Flux Drive Application

Installation 1: Main Pool Pump

The pump speed was reduced to 886 RPM at a flow rate of 260 GPM with the energy consumed dropping from approximately 10.2 kW to 2.2 kW for a savings of 8 kW. This is a documented 78 percent energy reduction or a savings of \$4,555 / year.

MAIN POOL Filter Pump Savings						
Pump Speed (RPM)	Flow Rate (GPM)	Energy Usage as Found (kW)	Actual Energy Usage with Flux Drive (kW)	Actual Energy Savings (kW)	Actual Savings per Year (kW h / yr)	Actual Saved Dollars per Year @ \$0.065 / kW h
1745	670	10.2	10.2	0	0	\$0.00
1388	520	--	6.38	3.62	31711.20	\$2,061.23
1303	485	--	5.50	4.50	39420.00	\$2,562.30
1197	420	--	4.41	5.59	48968.40	\$3,182.95
1068	370	--	3.62	6.38	55888.80	\$3,632.77
1015	320	--	3.02	6.98	61144.80	\$3,974.41
886	260	--	2.20	8.00	77080.00	\$4,555.00

Installation 2: Spa-Hydro Pump

After the Flux Drive adjustable speed drive was installed, the throttle valve was opened 100%, and the pump speed was reduced to 957 RPM for a flow rate of 160 GPM. Energy consumption went from 5 kW to 2.2 kWh for a savings of 2.8 kWh.

Prior to the installation of the Flux Drive, vibration levels on the Spa-Hydro pump were so excessive that the pump eventually failed due to a combination of misalignment and cavitation. With the Flux Drive ASD, vibration levels were significantly reduced and cavitation was eliminated by running at the reduced speed needed for 160 gpm. The vibration levels were less than 0.05 in/sec in the horizontal, vertical and axial directions. The noise level around the pump was also much lower.

SPA-HYDRO Filter Pump Savings						
Pump Speed (RPM)	Flow Rate w/valve (GPM)	Energy Usage (kW)	Actual Energy Usage with Flux Drive (kW)	Actual Energy Savings (kW)	Actual Savings per Year (kW h / yr)	Saved Dollars per Year @ \$0.065 / kW h
1750 (Valve)	160	5.0	--	--	0	0
957 Flux Drive	165	--	2.20 kW	2.80	24528.00	\$1,594.32



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Summary

The Flux Drive Adjustable Speed Drive installations provided documented energy savings for the Mel Korum Family YMCA. Installing Flux Drive ASD's to the Filter Pumps at the facility is saving utility and maintenance costs. Flux Drive's work with the Mel Korum Family YMCA demonstrates commitment to their motto "Energy Efficiency Made Easy."

Flux Drive's ASD solution also provided significant reduction in vibration levels, resulting in a quieter pump that has much less risk of mechanical failure. The Mel Korum YMCA pump space had also been a noisy area due to the vibration and cavitation of the pump. With the installation of Flux Drive ASD's, the overall noise reduction in the pump space was so significant that facility workers were actually concerned that the application wasn't running.