

Case Studies





Wilco Stratos Z vs. standard three piece bronze domestic recirc pump

This is a preliminary analysis of Wilco Z Domestic hot water recirculating pumps per our discussion last Tuesday. Following is a comparison of a Wilco Z pump with a standard pump.

Building 1506

Wilco Z: 1/8Hp, Single Phase, 208V

Meter Installed Date: 2/10/2012

Meter Reading(03/29/2012):15KWh; \$1.15

Pump Installed Cost: TFW

Electrical Rate:\$.077/kwh

Building 1511

Armstrong; 1/2 Hp, Single Phase, 110 V

Meter Installed Date:2/13/2012

Meter Reading(03/29/2012): 552KWh; \$42.5

Pump Installed Cost: TFW

Electrical Rate:\$.077/kwh

The logo for WILO, featuring the word "WILO" in a bold, green, sans-serif font. The letters are contained within a white rectangular box with a green border.

An Example of Over Pumping... at Immanuel Lutheran School

Original Circulators replaced with Stratos 3 x 3-40



An Example of Over Pumping...

Original Circulator

- 7.5 H.P, 3 Phase motor
- Motor drew 6426 watts
- Circulator ran 24/7 from October 1st to April 30th.
- 5040 hours x 6426 watts = 32,387,468 watt hours per season.
- $32,387,468 / 1000 = 32,387$ Kwh.
- $32,387 \times \$0.22 / \text{Kwh} =$
- \$7,125 per season for ONE circulator!

Stratos 3 x 3-40

- 2 H.P, 230v, 1 Phase motor
- Circulator set to 25 feet of head.
- 360 watts
- Pump history indicated head setting could be lowered.
- Set point lowered to 13 feet of head.
- Power consumption dropped to 250 watts.
- $250 \times 5040 = 1,260,000$ watt hours
- $1,260,000 / 1000 = 1,260$ Kwh.
- $1,260 \times \$0.22 = \277.20



Over Pumping Continues at Immanuel Lutheran School...

- Original pump specified to deliver 250 GPM @ 70' head.
- Pump choice determined by middle third of performance curve.
- As zones closed, pump head increased.
- The zone valves could not stop the flow of water.
- Rooms over heated. Teachers left with no alternative but to open the "window valve".
- Head of maintenance reported that the winter of 2007/8 was the first winter in his 20+ years at the school that NO windows were opened during the heating season.
- How much money was wasted dumping BTU's through open windows?

Williams Lake School

Williams Lake, BC



Williams Lake School

Williams Lake, BC

Power Consumption Estimates – Constant Speed Pumps vs. WILO Stratos

New Project – “P1” Hp ratings from pump selection software (Blue Angel Load Profile)

Full Load 10%, Partial Load 15%, Low Load 44%, Setback 35%

Service	GPM	Head	Control	Hp	KW Hrs	Hp	KW Hrs	KW Hrs
				P1 Stratos	Annual	Std	Annual	Difference
Leaving Furnace Rm	200	29'	Delta PV & LON	2.04	3797	3.16	12990	9193
1966 Rad & Coil	200	43'	Delta PV & LON	2.13	4489	4.09	15870	11381
Lunch Room/Dorm	200	40'	Delta PV & LON	2.11	4342	3.89	15580	11238
Ind Arts	200	32'	Delta PV & LON	2.08	4006	3.27	12560	8554
Boiler Room	200	6'	Delta PV & LON	0.89	1387	1.15	4544	3157
Gym	182	19'	Delta PV & LON	1.39	2589	2.35	8981	6392
1995 Rad Addn	194	37'	Delta PV & LON	2.1	4348	3.21	15050	10702
1995 Coil Addn	33	15'	Delta PV & LON	0.2	302	0.38	1357	1055
Office	21	36'	Delta PV & LON	0.387	879	0.77	2755	1876
Ent Furnace Rm	200	15'	Delta PV & LON	1.45	2298	2.21	9186	6888
P10 (New)	12.2	12'	Delta PV & LON	0.07	169	0.23	644	475
P11 (New)	52	12'	Delta PV & LON	0.26	501	0.41	1466	965
P12 (New)	52	12'	Delta PV & LON	0.26	501	0.41	1466	965
Tot Annual KW Usage					29608		102449	72841

Heating Days	240
Heating Hrs/Day	24
Annual Heating Hours	5760

Annual \$ Saving \$7,284
Savings based on Years \$72,841

Enter KWh Cost Here	0.1
Enter # of Years Here	10

Frisco School

Maine, USA

Power Consumption Estimates – Constant Speed Pumps vs. WILO Stratos

New Project – P1 Hp ratings from pump selection software

- Customer supplied load profile -

Service	GPM	Head	Control	P1 Stratos	Annual	Std	Annual	Difference
boiler circ.	25	10' w.g	const. flow control	0.1762	3787	0.5794	12454	8667
load-side circ.	25	35 w.g	integral speed control	1.207	25944	1.7656	37951	12007
HX circ.	8	8' w.g	temp dependant speed control	0.07879	1694	0.1037	2229	535
entire circ.	8	8' w.g	integral variable speed controller	0.07879	1694	0.1037	2229	535
boiler circ.	20	10' w.g	temp based speed control	0.1742	3744	0.2314	4974	1229
high temp loop circ.	9	15' w.g	integral variable speed controller	0.1112	2390	0.1415	3041	651
radiant slab	45	30' w.g	integral variable speed controller	0.6035	12972	1.0007	21510	8538
boiler circ.	18	10' w.g	const. flow control	0.1112	2390	0.1992	4282	1892
boiler circ.	4.5	8' w.g	integral variable speed control	0.07879	1694	0.0806	1732	39
Tot Annual KW Usage					56309		90402	34093

High Load	1448
Low Load	4848
Total	6296

Annual # Saving \$5,796
Savings based on Years \$57,958

\$/kwh	0.17
# Years	10

Maplegrove Co-operative Apartment

Moncton, NB



Maplegrove Co-operative Apartment

Moncton, NB

52 Unit, 6 story, multi-unit residential, conventional hot water heating system Heating Plant

- > Original oil fired forced draft hot water
- > New boilers installed – high efficient, condensing, natural gas type, balance of system not upgraded

Pumping Equipment

- > Existing 5 Hp, three piece inline type, constant speed
- > WILO Stratos installed, operating in parallel, constant pressure setting, setback enabled

Benefits

- > No zone valve failures (no excessive pressure during low heat demand periods)
- > No water hammer no pressure by-pass valve

Customer Comments

- > “This pumping technology is amazing, now we can rent the apartment unit above the boiler room because it is so quiet. The old pumps would make an awful racket. The electrical savings will pay for the installation of these two pumps in less than two years.”

Recorded Amperage/Energy Savings (based on \$0.08 per Kwh)

- > Original pumps – average 10 Amps, 6 month heating season, 24 hrs/day, 230 volt power
- > Annual operating cost - \$810.00
- > New pumps – average 0.9 Amps, 6 month heating season, 18 hrs/day (auto setback, priority DHW etc)
- > Annual operating cost - \$54.00
- > Annual savings \$756.00 (\$7,560.00 over 10 years – not including service/repair and energy cost increases)
- > Will power costs go up?
- > System condenses and there is a MINIMUM of 20 deg F across the boilers!

School

December 13, 2010

South Windsor Schools

Pleasant Valley School:

(2) original B&G 1510, 2 HP, 160 gpm @ 30'; operating cost: \$875. (second pump was back-up.)

(2) Stratos 3 x 3-40, projected cost prior to installation: \$440 each

12/6/2010 Determination: Stratos functioned 3,306 hours, 110 gpm (98% of the time) @ 25'; actual operating cost was \$145. (only one Stratos operated.)

School

Orchard Hill School:

(2) original B&G 1510, 2 HP, 160 gpm @ 30'; operating cost: \$875.
(second pump was back-up.)

(2) Stratos 3 x 3-40, projected cost prior to installation: \$478.

12/6/2010 Determination: Stratos functioned 3,460 hours, 62 gpm (98% of the time) @ 26'; actual operating cost: \$95. (only one Stratos operated.)

(2) original B&G 1510, 1.5 HP, 95 gpm @ 35'; operating cost: \$690.
(second pump was back-up.)

(2) Stratos 3 x 3-40, projected cost prior to installation: \$394

12/6/2010 Determination: Stratos functioned 3,410 hours, 135 gpm (98% of the time) @ 20'; operating cost was \$135. (only one Stratos operated.)

School

Phillip R. Smith School:

(2) original B&G 1510, 2 HP, 160 gpm @ 30'; operating cost: \$875.
(second pump was back-up.)

(2) Stratos 3 x 3-40, projected cost prior to installation: \$440 (only one Stratos operated.)

12/6/2010 Determination: Stratos functioned 2,696 hours, 60 gpm (97% of the time) @ 12'; actual operating cost was \$40. (only one Stratos operated.)

School

Note that our original projected electrical expense for Wilo Stratos was based upon 5,600 hours of operation, and 11 cents per KW operational cost. Actual operating cost based on same electrical rate. The overall annual electrical cost to operate the original (8) eight B&G base mounted pumps was \$3,315 and the during last year's heating season the eight Stratos cost \$415. The operating cost was reduced by 85%.

Northeastland Hotel Presque Isle, ME

Chiller Pump replacement

- The Original Pump
- End Suction Pump, 10HP 208/230 3phase
- The Approximate cost per year to run the Pump \$12,000

- The New Replacement Pump
- Stratos 3x3-40
- Estimated Electrical operating cost per year \$3,000



Audit form

Just write it down....



WILO PUMP AUDIT/SURVEY SHEET - _____ Date: _____

Job Site: _____ Location: _____ Pump Type _____

Flow: _____ Head: _____ Impeller size: _____

Other Pump Descriptive Information: _____

HP: _____ Voltage: _____ Phase: _____ Amp: _____ Amp: _____ Amp: _____

Motor Manuf.: _____ Eff: _____ Rpm: _____ Enclosure Type, ODP/TEFC _____

Pipe Size-Suction: _____ Pipe Size-Discharge: _____

Type of System, Hot Water, Chilled Water, etc. _____ Hours ON: _____ KW/HR= _____

Additional Comments:

WILO Recommended Selection(s): _____

List Pricing: _____

Delivery: _____

Cost of operation based on above hours on & kw/hr c/hr = _____

WILO Contact Person: _____

IEA (International Energy Agency - Facts and Figures)

“Factoids” on European Heating and Energy

- 78% of household energy costs is heating the home
- 90% if DHW (domestic hot water) is included
- 120 million heating pumps running in Europe
 - 60,000 giga watt hours annually!
- According to IEA, ECM technology has a potential of 70% savings
 - 42,000 giga watt hours annually
 - Equal to all washing machines and dishwashers in all Europe
- North America
 - Assume 3 million circs sold annually
 - Average circ life 10 years
 - Wattage per circ – 100 Watts
 - Totals 3 BILLION watts of power
 - Smart pump technology reduces power consumption by 2/3!
- Does not include systems savings
- Does not include all other larger pumps

