



# Board of County Commissioners Agenda Request

4A  
Agenda Item #

**Requested Meeting Date:** September 13, 2016

**Title of Item:** Purchase Boiler System

<input checked="" type="checkbox"/> REGULAR AGENDA	<b>Action Requested:</b>	<input type="checkbox"/> Direction Requested
<input type="checkbox"/> CONSENT AGENDA	<input checked="" type="checkbox"/> Approve/Deny Motion	<input type="checkbox"/> Discussion Item
<input type="checkbox"/> INFORMATION ONLY	<input type="checkbox"/> Adopt Resolution (attach draft)	<input type="checkbox"/> Hold Public Hearing* <i>*provide copy of hearing notice that was published</i>
<b>Submitted by:</b> Thomas Burke		<b>Department:</b> Health and Human Services
<b>Presenter (Name and Title):</b> Thomas Burke		<b>Estimated Time Needed:</b> 10 minutes
<b>Summary of Issue:</b> Our present boiler system is becoming increasingly difficult to repair. It has limped along over the past several years and is being recommended to be replaced. The recommendation is to replace the single boiler with two smaller, more efficient boilers. By having two smaller units, we would be able to function on one if the other is failing in any way.		
<b>Alternatives, Options, Effects on Others/Comments:</b>		
<b>Recommended Action/Motion:</b> Motion to accept the bid from General Heating and Mechanical for options 1 and 3.		
<b>Financial Impact:</b> Is there a cost associated with this request? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No What is the total cost, with tax and shipping? \$ Is this budgeted? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>Please Explain:</i> See the two attached bids for pricing.		

Legally binding agreements must have County Attorney approval prior to submission.

# GENERAL HEATING and MECHANICAL Co.



- COMMERCIAL/INDUSTRIAL HEATING EQUIPMENT
- PROCESS PIPING
- CERTIFIED WELDING
- BOILER REPAIR
- BOILER WATER TREATMENT
- HVAC
- PLUMBING
- ELECTRICAL

1922 WEST SUPERIOR STREET DULUTH MINNESOTA 55806

TELEPHONE (218) 727-1888 FAX (218) 727-6540

[www.general-heating.com](http://www.general-heating.com)

August 31, 2016

Aitkin Co. Courthouse  
Attn. Tom Bingham

RE: Health and Human Services building boiler replacement.

We are offering three options on the boiler replacement project.

Option one:

Replace your existing boiler with high efficiency condensing boilers. This would include:

- Two Lochinvar FTXL 500 boilers
- Two energy efficient variable speed boiler pumps. (Not the same as the main system pumps)
- PVC sealed combustion venting through existing chimney
- All necessary hydronic piping
- All necessary gas piping
- All necessary electrical, including reconnecting existing building energy management into the new system
- Demolition and proper disposal of the exiting boiler and old steam converter system.

Your cost: \$57,995.00

Option two:

Replace your existing boiler with standard efficiency boilers. This would include:

- Two Crown FW-4 boilers
- Two boiler pumps. (Not the same as the main system pumps)
- Venting through existing chimney
- All necessary hydronic piping
- All necessary gas piping

- All necessary electrical, including reconnecting existing building energy management into the new system
- Demolition and proper disposal of the exiting boiler and old steam converter system.

Your cost: \$41,995.00

Option 3:

Replace your existing main system pumps with high efficiency variable speed pumps. This would include:

- Two Wilo Statos self-regulating high efficiency pumps
- All necessary electrical
- All necessary piping modifications

This option pricing is based on it being done at the same time as option one or two.

Your cost: \$8,595.00

Sincerely,



Dale Brodin

Lochinvar.com

USA  
A Division of Lochinvar Associates

HIGH EFFICIENCY BOILERS & WATER HEATERS

Lochinvar



ATRIUM CERTIFIED  
**98%**  
THERMAL EFFICIENCY



WIRELESS OUTDOOR SENSOR CAPABLE

4 PUMP CONTROL

SMALL 6.2 SQ. FT. FOOTPRINT

FLOW RATES FROM 10 TO 150 GPM

COMMON VENT AND PVC DIRECT-VENTING

UP TO 10:1 TURNDOWN RATIO

5 INPUTS FROM 399,999 TO 850,000 BTU/HR

LOCH-N-LINK® USB DRIVE SETUP

CASCADING SEQUENCER

CON-X-US® REMOTE CONNECT CAPABLE

SMART SYSTEM

ALL THE POWER  
**FTXL**

HIGH EFFICIENCY BOILERS



## THE NEW 98% STANDARD

Lochinvar re-defined the fire-tube boiler category with its KNIGHT™ Wall-Mount and CREST® lines. For residential and light commercial applications, the FTXL™ adds models from 399,999 to 850,000 Btu/hr, and takes Lochinvar's fire-tube technology to the next level. FTXL offers best-in-class AHRI Thermal Efficiency and footprints, plus remote connectivity that puts the SMART SYSTEM™ control at your fingertips, anywhere!

### REDUCE INSTALLATION COST WITH VARIABLE FLOW TECHNOLOGY

FTXL can operate over a wide range of flow rates\* with very low pressure drop. This permits installation of a "full flow" (variable primary) system eliminating the time and materials cost of primary/secondary piping, and pumps needed to maintain flow in a water-tube boiler. Variable flow also makes FTXL more flexible at handling frequent fluctuations in the system flow rate.

\*See data page for minimum and maximum flow rates by model.

### SMOOTH-RUNNING, MODULATING COMBUSTION

FTXL boilers have a top-mounted, micrometal fiber burner, with a blower/gas valve assembly that drives heat energy downward, through stainless steel fire tubes, with exhaust venting through the bottom of the unit. With up to 10:1 modulation/turndown, the burner automatically changes its firing rate as building heat loads vary. An FTX560 fires at its maximum 500,000 Btu/hr rate when heat load is highest, then gradually "turns down" to as low as 50% (250,000 Btu/hr) as load decreases. A modulating system runs smoothly and efficiently, without frequent on/off cycling.

### MINIMUM SUPPLY PRESSURE, INSTALLER-FRIENDLY

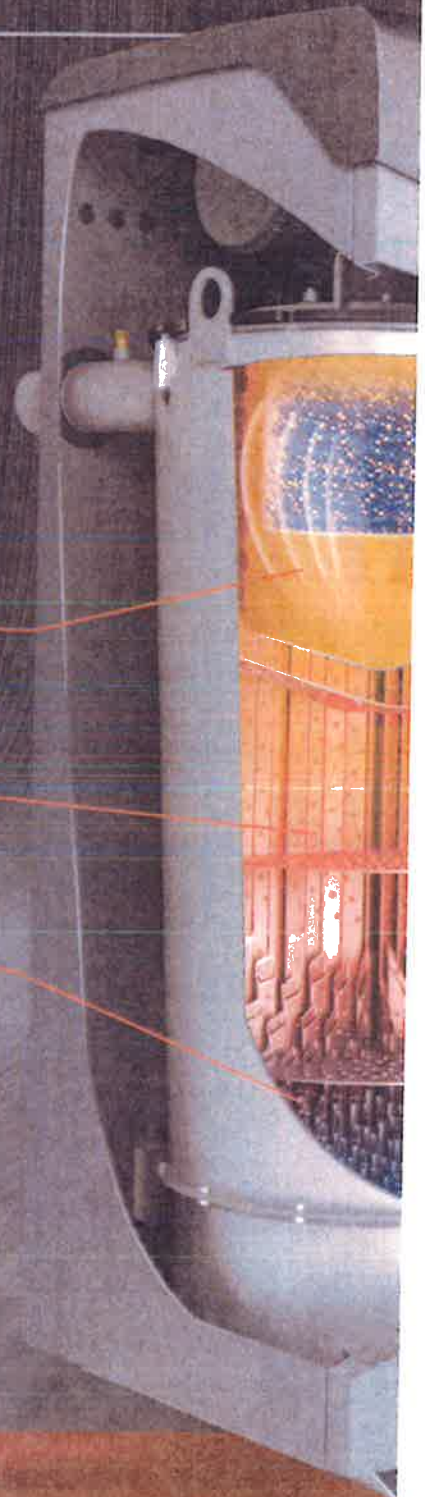
FTXL operates with supply gas pressure as low as 4 inches water column. *Negative Regulation* draws gas into a pre-mix combustion system, instead of relying on utility pressure through the gas valve. The result is steady operation in low gas pressure systems or when peak demand occurs on gas supply. Automatic fan speed control fine-tunes the correct fuel/air ratio entering the burner, providing superior combustion throughout the entire operating range.

MICROMETAL FIBER BURNER  
DELIVERS HEAT TO THE  
COMBUSTION CHAMBER

SAFFLES DIRECT THE  
FLOW OF WATER FOR  
OPTIMAL HEAT TRANSFER

WATER ENTERS THE BOTTOM  
AND TRAVERSES UP AND  
AROUND FIRE TUBES

DOWNWARD FLOW OF FLUE  
GASES TRANSFER HEAT  
WITHIN FIRE TUBES

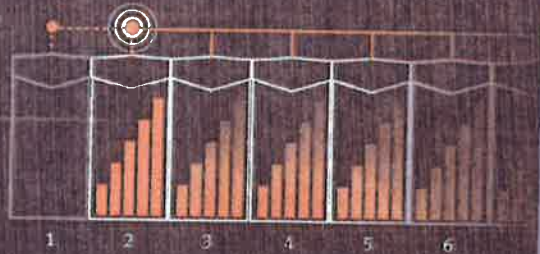




## PEACE OF MIND, WHEN IT MATTERS MOST

Up to eight FTXL boilers can be sequenced using a 2-wire daisy-chain connection. Cascade sequencing can be programmed for "Lead-Lag" or "Efficiency Optimized" operation.

With Lead-Lag operation, one lead boiler modulates to capacity on demand. As load increases, the system then cascades to additional lag boilers in sequence. The first-on role shifts daily, distributing equal runtimes to each unit.



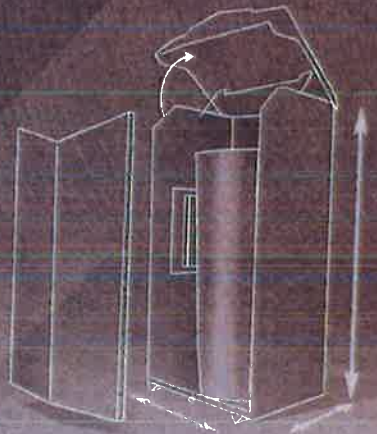
In an Efficiency Optimized system, all boilers fire and modulate simultaneously at the same Btu/hr input rates, maximizing thermal efficiency.

If the lead boiler is turned off for maintenance, Cascade Redundancy automatically shifts the lead role to the second sequenced boiler. Peace of mind comes from knowing the system will still function with no downtime until the original lead boiler is back online.

## THE SMALLEST FOOTPRINT, EASY TO INSTALL & SERVICE

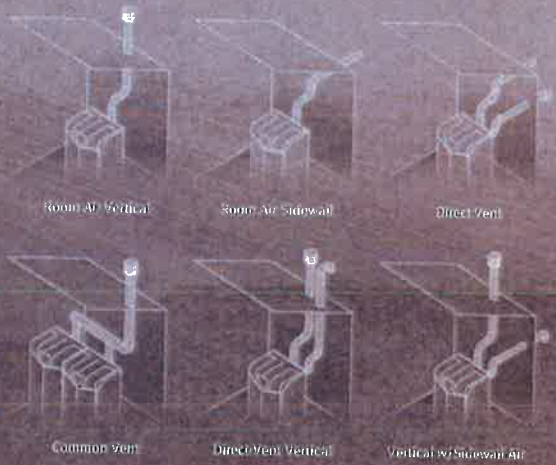
FTXL can be installed with zero clearance on the left and right, and the boiler's installed footprint is just 6.2 sq. ft.

All water, gas and vent connections are in the back of the unit. A hinged top opens for easy access to components, and the front panel is easily removed using no tools.



## FLEXIBLE VENTING OPTIONS

FTXL offers 6 venting options, and permits direct vent air intake and exhaust runs up to 100 equivalent feet, using PVC, CPVC, polypropylene or stainless-steel pipe. Plus multiple units can be common-vented to reduce time and materials costs.



**TO LEARN MORE, LOG ON TO [WWW.FTXLBOILER.COM](http://WWW.FTXLBOILER.COM) TODAY!**



## INTRODUCING BOILER PLANT CONTROL, FROM ANYWHERE.

FFXL features the next generation of Lochinvar's all-in-one SMART SYSTEM operating control with a re-designed multi-color LCD interface. SMART SYSTEM provides outstanding functionality, and can be integrated directly into a Building Automation System via ModBus and other communications protocols. And now, the CON-X-US mobile communication platform allows SMART SYSTEM to go where no other boiler has gone before.

### SMART SYSTEM

CON-X-US provides the ability to monitor and manage multiple FFXL boiler plants without ever stepping into the mechanical room. CON-X-US will send alerts via text or e-mail notifying of changes in system status, and anytime, from anywhere, a user can check system status and re-program any boiler function. Once downloaded, the free CON-X-US mobile application allows for remote access to all SMART SYSTEM functions using any Internet-capable device.



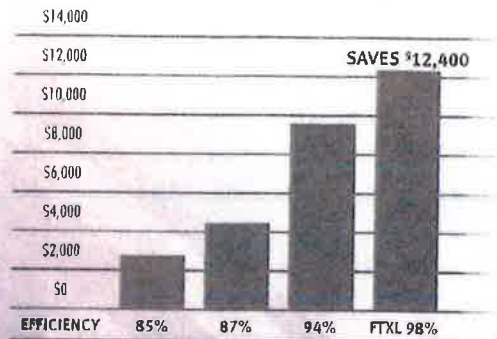
CON-X-US control board sold separately. See back cover for a complete list of SMART SYSTEM features.

## HOW 98% TRANSLATES INTO FTXL SAVINGS

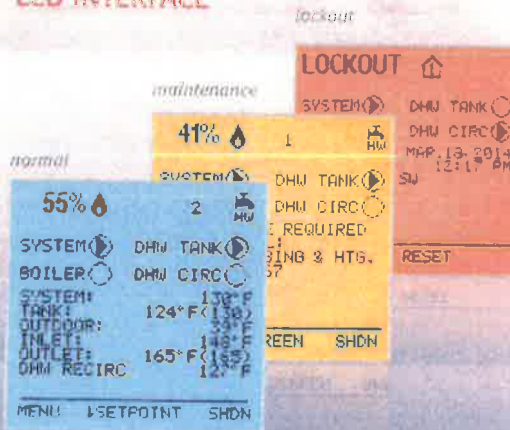
Even when compared to other condensing boilers, the FTXL fire-tube combustion system will produce significant fuel cost savings. Here are three comparisons, based on building load of approximately 19,000 therms/year, at a cost of \$1.09 per therm of natural gas.

Fuel savings is based on a heating load of 19,000 therms per year being supplied by an 82% efficient boiler at the DOE National average for natural gas of \$1.09.

## 3 - Year Fuel Savings



## ENHANCED MULTI-COLOR LCD INTERFACE

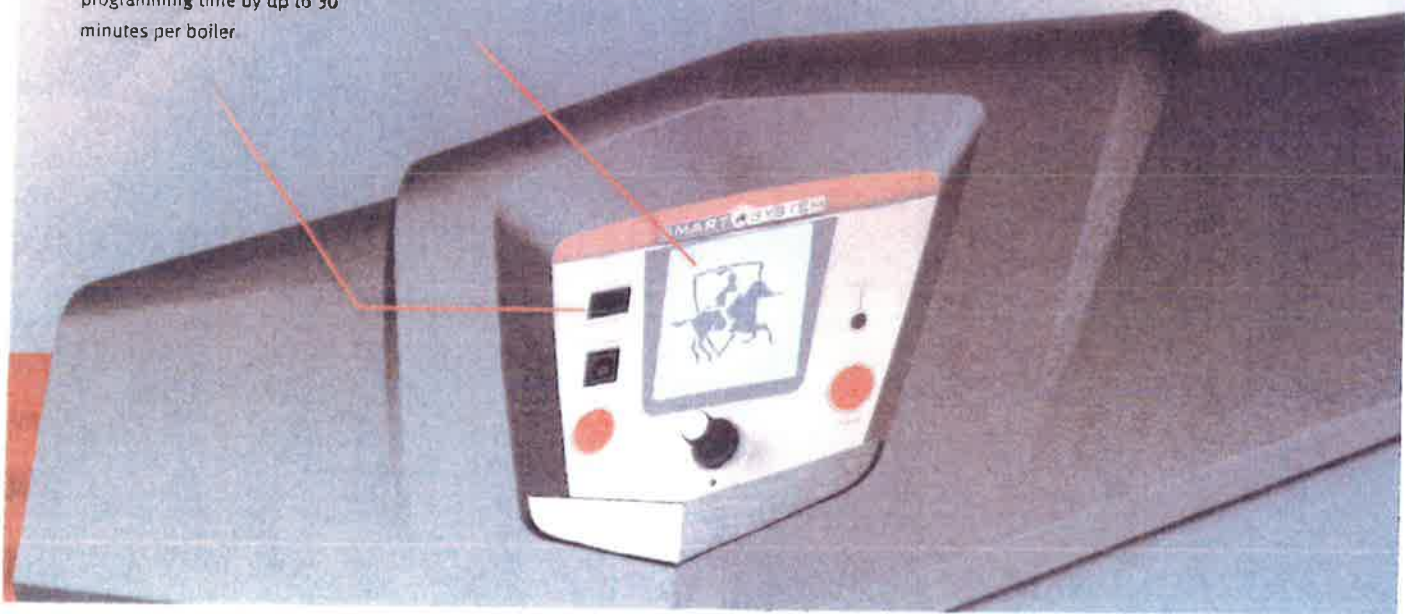


## WIRELESS OUTDOOR SENSOR

Easy to install, greatly reduces time and materials cost for running sensor wire from standard outdoor temperature sensor to boiler control. Approximate range 2,000 feet line-of-sight.

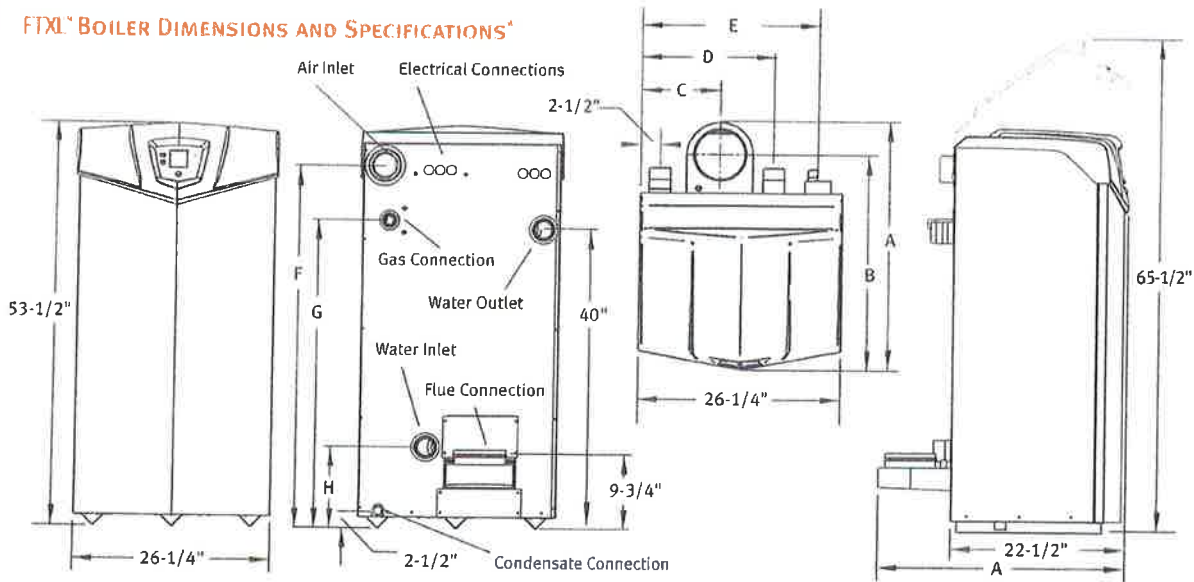
## LOCH-N-LINK® EASY USB FLASH PROGRAMMING

Use a USB drive to name, store and easily manage multiple existing proven parameter sets. Quickly upload them via the front panel port into the FTXL boiler, reducing installation and programming time by up to 30 minutes per boiler.





## FTX<sup>®</sup> BOILER DIMENSIONS AND SPECIFICATIONS\*



Model Number	Input		Thermal Efficiency	Thermal Output MBH	NET AHRI		Flow (GPM) Min. Max.	HEX Water Volume	A	B	C	D	E	F	G	H	Water Conn.	Vent Size	Air Intake	Gas Conn.	Shipping Wt. (lbs.)	
	Min. MBH	Max. MBH			Rating MBH	Turn down																
FTX400(N,L)	40.0	399.9	98.0%	392	341	10:1	10	105	13	30-1/2"	27-1/2"	10-1/4"	17"	23-1/4"	45-1/4"	39-1/2"	10-3/4"	2"	4"	4"	1"	435
FTX500(N,L)	50.0	500.0	97.7%	489	425	10:1	15	105	12	30-1/2"	27-1/2"	10-1/4"	17"	23-1/4"	45-1/4"	39-1/2"	10-3/4"	2"	4"	4"	1"	460
FTX600(N,L)	85.0	600.0	97.5%	585	509	7:1	15	105	12	30-1/2"	27-1/2"	10-1/4"	17"	23-1/4"	45-1/4"	39-1/2"	10-3/4"	2"	4"	4"	1"	470
FTX725(N,L)	103.5	725.0	97.2%	705	613	7:1	20	150	17	33"	28-1/2"	10-1/2"	17-1/2"	23-1/2"	48-1/2"	41-1/4"	11"	2-1/2"	6"	4"	1"	510
FTX850(N,L)	121.5	850.0	97.0%	825	717	7:1	25	150	16	33"	28-1/2"	10-1/2"	17-1/2"	23-1/2"	48-1/2"	41-1/4"	11"	2-1/2"	6"	4"	1"	535

\*Information subject to change without notice.  
 Dimensions are in inches. Select "N" for "L" or Natural or "L" gas.

### SMART SYSTEM FEATURES

- ▶ **Smart System Digital Operating Control**  
Multi-Color Graphic LCD Display w/Navigation Dial
- ▶ **Loch-N-Link<sup>®</sup> USB Thumb Drive Port for Easy Programming**
- ▶ **Cascading Sequencer with Built-in Redundancy**  
Selectable Cascade Type:  
Lead Lag/Efficiency Optimization  
Multiple Size Boilers  
Front-End Loading
- ▶ **3 Reset Temperatures Inputs w/Independent Outdoor Reset Curves for Each**  
Outdoor Sensor
- ▶ **Four-Pump Control**  
System Pump with Parameter for Continuous Operation  
Boiler Pump with Variable-Speed Control  
Domestic Hot Water Boiler Pump  
Domestic Hot Water Recirculation Pump Control with Sensor
- ▶ **Building Management System Integration**  
0-10 VDC Input to Control Modulation or Setpoint  
0-10 VDC Input from Variable-Speed System Pump  
0-10 VDC Modulation Rate Output Signal  
0-10 VDC Enable/Disable Signal
- ▶ **Programmable System Efficiency Optimizers**  
Space Heating Night Setback  
DHW Night Setback  
Anti-Cycling  
Ramp Delay  
Boost Time and Temperature
- ▶ **High-Voltage Terminal Strip**  
120 VAC/60 Hertz/1 Phase  
Pump Contacts for 3 Pumps

- ▶ **Low-Voltage Terminal Strip**  
Building Recirculation Pump Start/Stop  
Proving Switch Contacts  
Flow Switch Contacts  
Alarm Contacts  
Runtime Contacts  
3 Space Heat Thermostat Contacts  
Tank Thermostat Contacts  
System Sensor Contacts  
Tank Sensor Contacts  
Cascade Contacts  
0-10 VDC BMS Contacts  
0-10 VDC Boiler Rate Output Contacts  
0-10 VDC Boiler Pump Speed Contacts  
0-10 VDC System Pump Speed Contacts  
ModBus Contacts
- ▶ **Time Clock**
- ▶ **Data Logging**  
Ignition Attempts  
Last 10 Lockouts  
Space Heat Run Hours  
Domestic Hot Water Run Hours

### STANDARD FEATURES

- ▶ **97%-98% Thermal Efficiency**
- ▶ **Modulating Burner with up to 10:1 Turndown**  
Direct Spark Ignition  
Low NOx Operation  
Sealed Combustion  
Low Gas Pressure Operation
- ▶ **Stainless Steel Fire-Tube Heat Exchanger**  
ASME-Certified, "H" Stamped  
160 psi Working Pressure  
50 psi Relief Valve  
Combustion Analyzer Test Port  
Fully Welded Design

- ▶ **Vertical and Horizontal Direct Vent**  
Direct Vent up to 100 feet  
PVC, CPVC, Polypropylene or AL29-4C  
Factory Supplied Sidewall Vent Termination
- ▶ **Smart System Control**
- ▶ **Other Features**  
On/Off Switch  
Adjustable High Limit with Manual Reset  
Automatic Reset High Limit  
Manual Reset Low Water Cutoff  
Flue Temperature Sensor  
Low Air Pressure Switch  
Temperature and Pressure Gauge  
Condensate Trap  
Zero Service Clearances  
10-Year Limited Warranty (See Warranty)  
Custom Maintenance Reminder with Contact Info  
Password Security  
Customizable Freeze Protection Parameters

### OPTIONAL EQUIPMENT

- CON-X US Remote Connectivity
- Motorized Isolation Valve
- Wireless Outdoor Temperature Sensor
- Multi-Temperature Loop Control
- Variable-Speed Boiler Circulator
- Constant-Speed Boiler Circulator
- ModBus Communication
- Alarm Bell
- Condensate Neutralization Kit
- Concentric Vent Kit (FTX400-FTX600)
- BMS Gateway to BACnet or LonWorks
- High and Low Gas Pressure Switches w/Manual Reset (FTX500-FTX850)
- ▶ **Firing Controls**  
M9-Standard Construction  
M13-CSD-1/FM/GE Gap (FTX500-FTX850)



Lochinvar, LLC  
 300 Woodcock Simonson Parkway  
 Johnson, Tennessee 37090  
 ▶ 615-489-3900 • 615-367-1000  
 f t i n Lochinvar.com



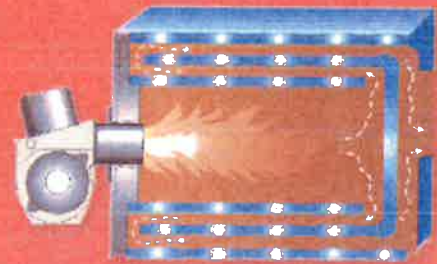


## FW SERIES

Cast Iron 3-Pass Scotch Marine Boiler designed for use with light oil, gas, or a light oil-gas combination.



The FW boiler uses a 3-pass heat exchanger, designed to maximize heat transfer from flue gases to the boiler water, and to minimize the amount of cast iron and water that must be heated. This is achieved by circulating the hot flue gases through the heat exchanger three times, resulting in a more efficient boiler.



- AHRI burner input 433 to 1,299 MBH
- 3-Pass scotch marine design
- Cast iron push nipples and boiler sections
- Woven glass ropes between sections
- Swing open burner door
- Pressurized for forced draft venting or chimney draft
- Stainless steel baffles easily removed via front door
- Rear flue outlet with quadrant locking damper
- Exclusively designed for forced hot air circulation
- Powder coated, textured, insulated jacket
- 10-year limited warranty

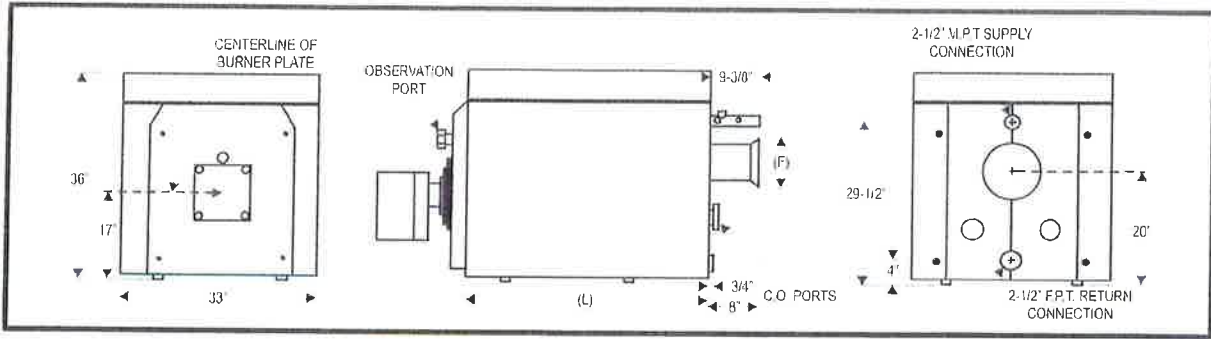
See back side for piping configurations

Quality  
Value  
Service

VelocityBoilerWorks.com | Philadelphia, PA

# FW SERIES

## TECHNICAL SPECIFICATIONS



MODEL	BURNER INPUT		GROSS OUTPUT		AHRI NET WATER RATING (MBH)	WATER CONTENT (GAL)	DRAFT LOSS (IN. W.C.)	DIMENSIONS (IN.)			DRY WEIGHT (LBS)
	OIL (GPH)	GAS (MBH)	MBH	BHP				[F] VENT DIA.	AHRI VENT DIA.*	[L]	
FW-4	3.0	433	355	10.6	309	15.8	0.16	8	7	26	1126
FW-5	4.0	577	478	14.2	416	19	0.27	8	7	37	1313
FW-6	5.0	722	600	17.9	522	22.2	0.39	10	8	42	1524
FW-7	6.0	866	723	21.6	629	25.4	0.51	10	9	47	1743
FW-8	7.5	1082	907	27.1	789	28.5	0.62	10	10	52	1947
FW-9	9.0	1299	1091	32.6	949	31.7	0.75	10	10	57	2143

\*AHRI Vent Diameter size is the pipe size used from boiler vent connector [F] to termination of stub stack; max. height 15' (for forced draft firing only). For chimney venting consult National Fuel Gas Code.


1. Altitudes above 2,000 ft. - ratings should be reduced at a rate of 4% for each 1,000 ft. above sea level (US only).

2. The AHRI Net Water Ratings are based on a piping and pickup allowance of 1.15.

3. The manufacturer should be consulted before selecting a boiler for installations having unusual piping and pickup requirements, such as intermittent system operation, extensive piping systems, etc.

MODEL	BURNER MOTOR			BURNER MODEL LIGHT OIL	BURNER MODEL GAS	BURNER MODEL GAS/OIL COMB.	GAS TRAIN SIZE	MIN. GAS PRESS REQ. @ BURNER (IN. W.C.)
	MFG.	HP	VOLTAGE					
FW-4	BECKETT	1/3	120-1	CF-500	CG-10	----	----	----
	POWER FLAME	1/3	120-1	C1-0	C1-G-10	C1-GO-10	1-1/4	5.5
FW-5	BECKETT	1/3	120-1	CF-800	CG-10B	----	----	----
	POWER FLAME	1/3	120-1	C1-0	C1-G-10	C1-GO-10	1-1/4	5.5
FW-6	BECKETT	1/3	120-1	CF-800	CG-10B	----	----	----
	POWER FLAME	1/3	120-1	C1-0	C1-G-10	C1-GO-10	1-1/4	5.5
FW-7	BECKETT	1/2	120-1	CF-1400	----	----	----	----
	POWER FLAME	1/3	120-1	C1-0	C1-G-10	C1-GO-10	1-1/4	5.5
FW-8	BECKETT	1/2	120-1	CF-1400	----	----	----	----
	POWER FLAME	3/4	230-1	C2-OA	C2-G-15	C2-GO-15	1-1/2	7.0
FW-9	BECKETT	1/2	120-1	CF-2300	----	----	----	----
	POWER FLAME	3/4	230-1	C2-OA	C2-G-15	C2-GO-15	1-1/2	7.0

All cast iron boiler models include a full one-year warranty. A 10-year limited warranty is provided for the heat exchanger. A 5-year and a 10-year extended warranty covering parts and labor are also available. Visit [VelocityBoilerWorks.com](http://VelocityBoilerWorks.com) or see your warranty for complete details.

 The Mega-Stor® indirect water heater utilizes the energy created by your boiler to produce abundant hot water for your home. Mega-Stor water heaters come in a variety of sizes from 26 to 119 gallons to meet a multitude of residential and commercial needs.

Specifications are subject to change without notice.



CRN:7361.78YT



[VelocityBoilerWorks.com](http://VelocityBoilerWorks.com) | Philadelphia PA

FW - 08/15  
PN 980520 - R3

Pioneering for You

wilo®

*Energy savings solutions for HVAC applications - North America.*

## High Efficiency Pumps & Circulators

Stratos ECO, Stratos/D/Z/GIGA, Helix Excel



# Wilo

Pioneering for You.



**We are there for you worldwide.**

Since 1872, we at Wilo have been turning visionary ideas into intelligent solutions that regularly set new standards in the industry. Louis Opländer, the founder of Wilo, used his copper and brass goods factory to improve and facilitate the supply of water and bring heat to people. In 1928, he designed the world's first circulation accelerator and revolutionized the field of heating technology. Ever since then, our company continues to pioneer innovations such as the world's first high-efficiency pump for heating, air-conditioning and cooling and the world's first decentralized pump system. Today Wilo SE, headquartered in Germany, is one of the world's leading manufacturers of pumps and pump systems for heating, air-conditioning and cooling, water supply and sewage disposal. With over 7,000 employees and 70 subsidiaries worldwide, we personally see to it that our customers wants and needs are optimally met every day – with pioneering developments, high-efficiency products, and tailored solutions.



**We are there for you locally.**

Wilo is synonymous throughout the world with the tradition of first-class German engineering. Just over a decade ago, Wilo entered into America. With a manufacturing facility in Thomasville, Georgia and headquarter offices in Rosemont, Illinois, Wilo USA continues to drive new technology and innovation into the United States pump & systems market.

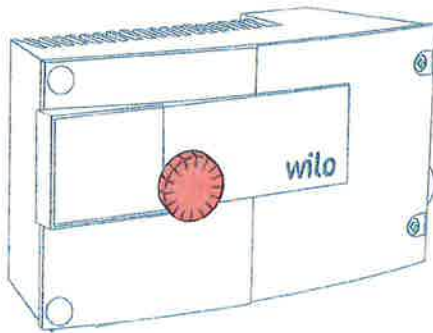
**That's what we call Pioneering for You.**

## Wilo High Efficiency Pumps

The world's first high efficiency circulator!

### Twice the efficiency thanks to ECM Technology.

Energy is a valuable commodity. This is why Wilo created the world's first high-efficiency circulator in 2001. With the help of ECM technology, this efficient, functional and flexible pump for heating, cooling, and air conditioning reduces annual power consumption by up to 80%. Standing for Electronically Commutated Motor, ECM essentially comprises a synchronous motor with a permanent magnet rotor. The unique rotor-stator construction helps eliminate electrical losses.



### Simple to operate.

The proven "red button" makes Wilo ECM pumps very simple and comfortable to operate. Whether you need to set your head, flow, or choose a control mode, all essential functions can be controlled by this one button.

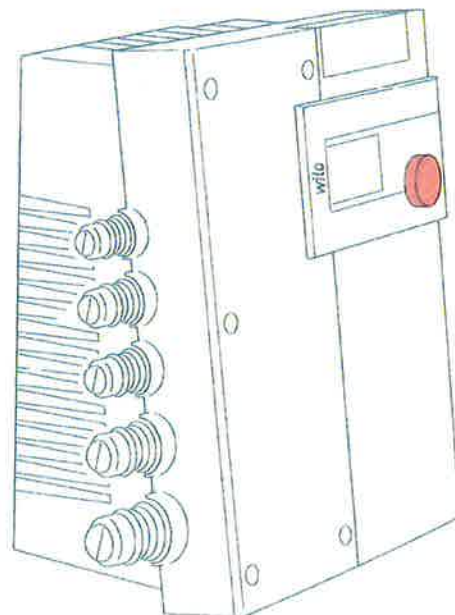


### Simple display.

The front-mounted LCD display shows important operational data for technicians to read whenever necessary. The Wilo IR-monitor can be used to operate by remote control and read its data from up to 30 feet away.

### Simple to wire.

Wilo offers the right functionality for every application. In addition to issuing standard collective error messages, Wilo high efficiency pumps can be optionally connected to local operating networks (LON), IF (interface) modules with integrated dual-pump management, and 0-10V DC capabilities. With these additions, Wilo fulfills all requirements for professional building management.



# Wilo Stratos ECO

## High Efficiency Circulators

### Applications:

- Hot Water Heating Systems
- HVAC Applications
- Residential Heating
- Water/Glycol up to 50%
- Solar / Geothermal



**Up to 80% Energy Savings!\***

### Features & Benefits

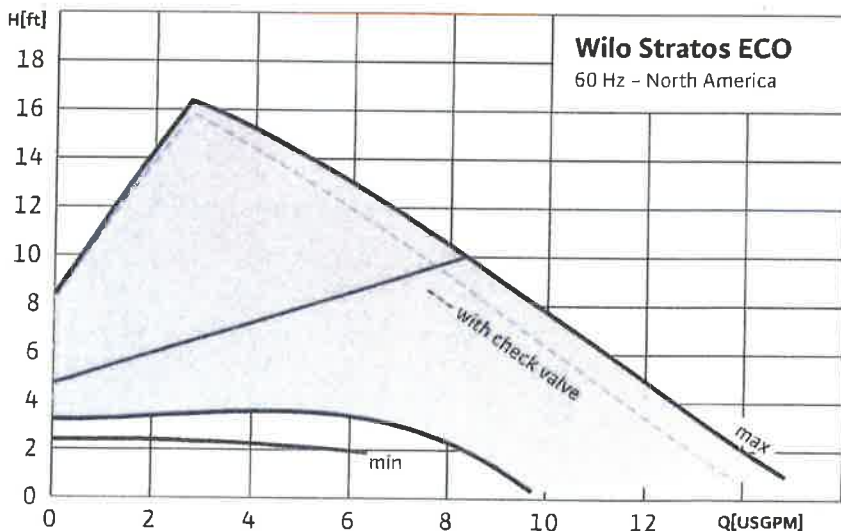
- Patented 360° Flange rotates to 12/6 or 3/9 o'clock positions (US 8,297,664 B2)
- Installable hi-temp check valve included
- EC motor technology reduces energy consumption by up to 80%
- Automatically adjusts to system demands
- No more over-pumped, noisy zones
- Easy wiring quick connectors

### Technical Data

- Temp Range: 60°F to 230°F (15°C to 115 °C)
- Amb Temp Range: 14°F to 104°F (-10°C to 40 °C)
- Electrical Connection: 1~115v
- Max Working Pressure: 145 PSI
- Max flows: 14 USGPM
- Max Head: 16 feet

### Materials of Construction

- Cast Iron Volute
- Cast Iron Rotating Flange
- Engineered Composite Impeller
- Stainless Steel Shaft
- Carbon Impregnated Bearing



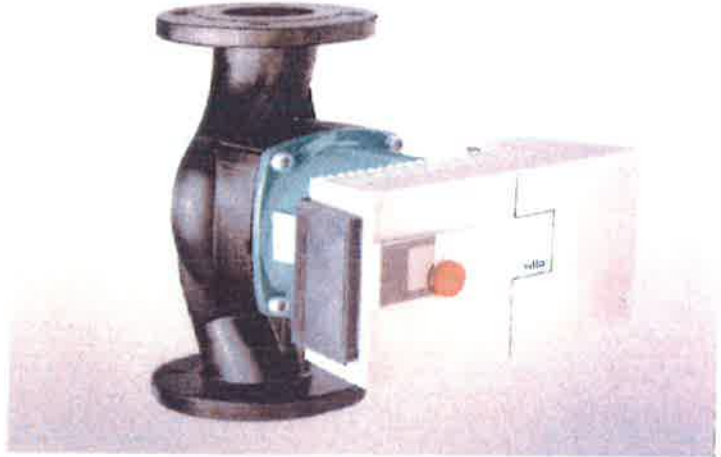
\*Compared to an uncontrolled circulator

# Wilo Stratos

## High Efficiency Circulators

### Applications:

- Hot Water Heating Systems
- Closed Cooling Circuits
- Air Conditioning systems
- Water/Glycol concentrations up to 50%
- Solar / Geothermal



**Up to 80% Energy Savings!\***

### Features & Benefits

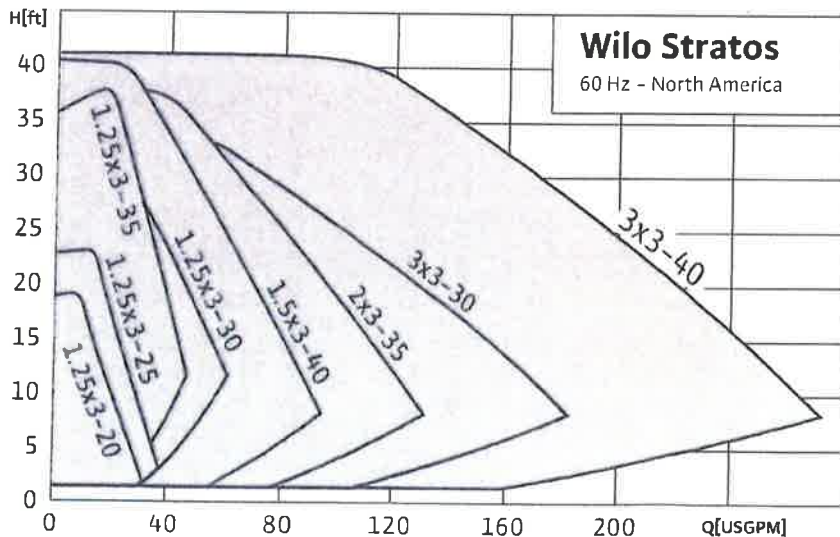
- EC motor technology reduces energy consumption by up to 80%
- 'Red Button' technology and LED display
- 3 times higher starting torque than a standard circulator
- On-board diagnostics and data logger
- Multiple control modules available for integration with building management systems

### Technical Data

- $\Delta P$ -V,  $\Delta P$ -C,  $\Delta P$ -T speed control or external signals with IF module.
- Temp Range: 14°F to 230°F (-10°C to 110°C)
- Electrical Connection: 1~230v (+/- 10%)
- Max flows: 285 USGPM
- Max Head: 43 feet

### Materials of Construction

- Cast iron, Cataphoresis Coated Volute
- Engineered Composite Impeller
- Stainless Steel Shaft
- Carbon Impregnated Bearing



Compatible with  
IR Device & IF Modules



\*Compared to an uncontrolled circulator.

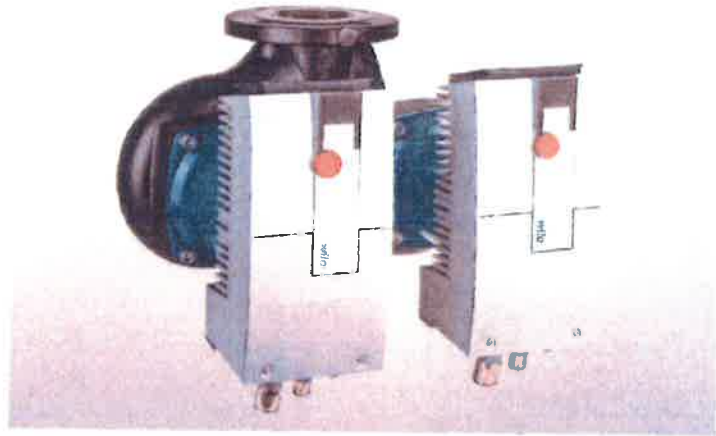


# Wilco Stratos D

## High Efficiency Circulators

### Applications

- Hot Water Heating Systems
- Closed Cooling Circuits
- Air Conditioning Systems
- Solar / Geothermal



**Up to 80% Energy Savings!\***

### Features & Benefits

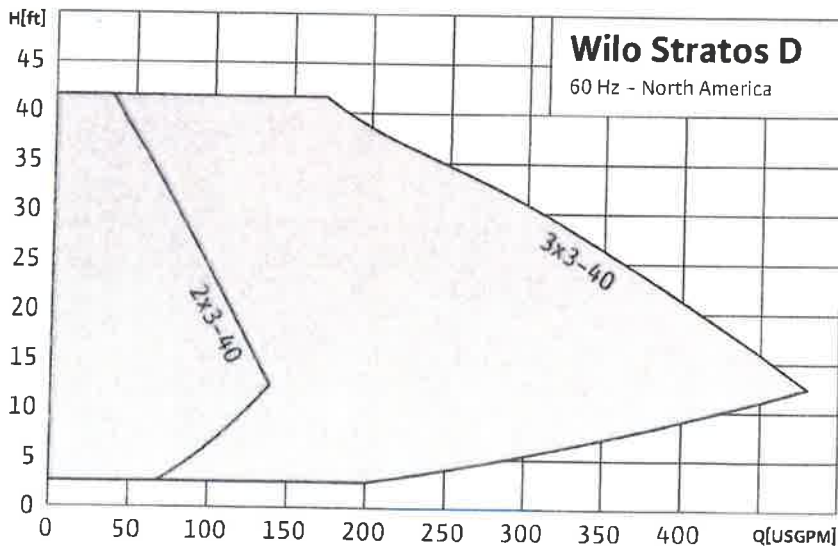
- EC motor technology reduces energy consumption by up to 80%
- 'Red Button' technology and LED display
- Lead/Lag operation with auto 24-hr alternation
- Dual-volute design cuts installation costs by up to 50%
- Optimized peak load operation

### Technical Data

- $\Delta P$ -V,  $\Delta P$ -C,  $\Delta P$ -T speed control or external signals with IF module.
- Temp Range: 14°F to 230°F (-10°C to 110°C)
- Electrical Connection: 1-230v (+/- 10%)
- Max flows: 480 USGPM
- Max Head: 43 feet

### Materials of Construction

- Cast Iron, Cataphoresis Coated Volute
- Composite Impeller
- Stainless Steel Shaft
- Carbon, Metal Impregnated Bearing



Compatible with IR Device & IF Modules



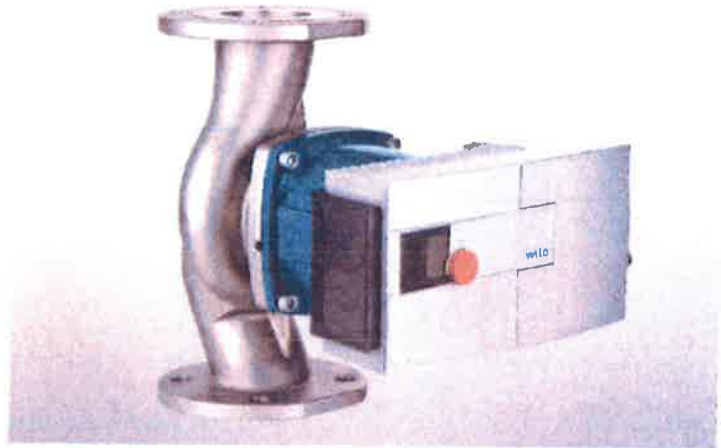
\*Compared to an uncontrolled circulator

# Wilo Stratos Z

## High Efficiency DHW Circulators

### Applications:

- Potable Water
- Domestic Hot Water
- Closed Cooling Circuits
- HVAC Systems
- Solar / Geothermal



**Up to 80% Energy Savings!\***

### Features & Benefits

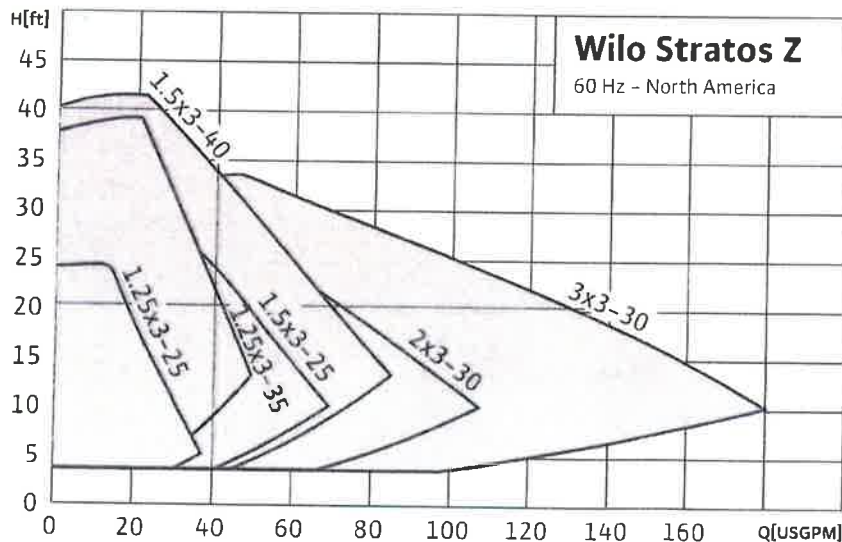
- NSF 61 / NSF 372 Certified
- EC motor technology reduces energy consumption by up to 80%
- 'Red Button' technology and LED display
- Multiple control modules available for integration with building management systems
- Built in overload fault contacts (opens on over/under voltage, dry run, locked rotor, overload and over temperature)

### Technical Data

- $\Delta P-V$ ,  $\Delta P-C$ ,  $\Delta P-T$  speed control or external signals with IF module.
- Temp Range: 14°F to 230°F (-10°C to 110°C)
- Electrical Connection: 1~230v (+/- 10%)
- Max flows: 180 USGPM
- Max Head: 43 feet

### Materials of Construction

- Stainless Steel Volute
- Engineered Composite Impeller
- Stainless Steel Shaft
- Carbon Impregnated Bearing



Compatible with  
IR Device & IF Modules



\*Compared to an uncontrolled circulator

# Wilco Stratos GIGA

## High Efficiency Inline Circulators

### Applications

- Hot Water Heating Systems
- Industrial Circulation
- Closed Cooling Circuits
- Air Conditioning Systems
- Solar / Geothermal



**Up to 70% Energy Savings!\***

### Features & Benefits

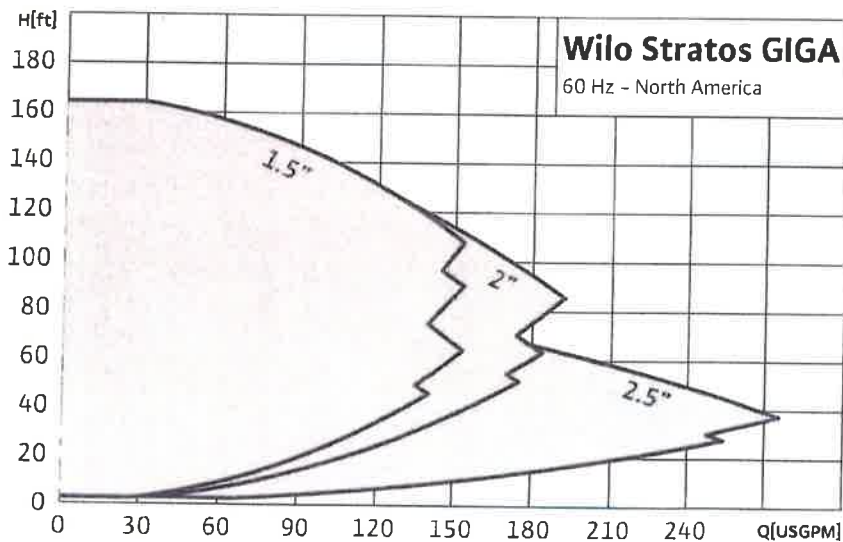
- Highest efficiency motor-drive combination on the market up to 7.5HP
- Compact, Space-saving design
- 'Red Button' technology and LED display
- Various control modes:  $\Delta$ PV,  $\Delta$ PC,  $\eta$ , PID
- Multiple control modules available for integration with building management systems

### Technical Data

- Temp Range: -4°F to 284°F (-20°C to +140°C)
- Max Amb Temp: 104°F (40°C)
- Max Operating Pressure: 232 PSI
- Electrical Connection: 3~460v
- IP 55 Enclosure
- Max flows: 275 USGPM
- Max Head: 167 feet

### Materials of Construction

- Cast Iron, Cataphoresis Coated Volute
- Cast Iron Lantern
- High-Temp, High-Pressure Engineered Composite Impeller
- Stainless Steel Pump Shaft



**Greater than NEMA Premium Efficiencies!**



Compatible with IR Device & IF Modules



\*Compared to an uncontrolled circulator

# Wilco Helix Excel

## High Efficiency Multistage Pumps

### Applications

- Water Supply and Pressure Boosting
- Process water
- Pressure Washing Systems
- Industrial Circulation Systems
- Cooling water
- Irrigation



**Up to 70% Energy Savings!\***

### Features & Benefits

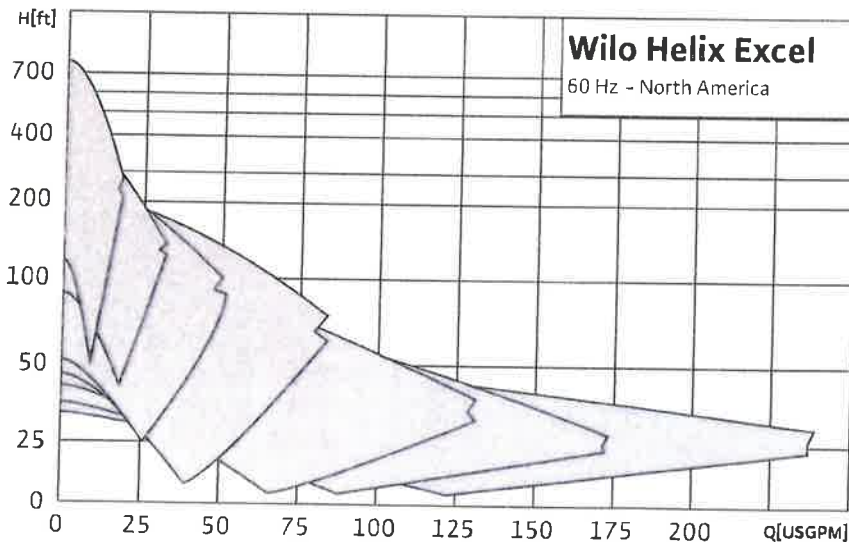
- Highest efficiency motor-drive combination on the market
- Uses cartridge seal for easy maintenance
- 'Red Button' technology and LED display
- Various control modes:  $\Delta$ PV,  $\Delta$ PC,  $\eta$ , PID
- Multiple control modules available for integration with building management systems

### Technical Data

- Temp Range:  $-4^{\circ}\text{F}$  to  $248^{\circ}\text{F}$  ( $-20^{\circ}\text{C}$  to  $+120^{\circ}\text{C}$ )
- Max Amb Temp:  $104^{\circ}\text{F}$  ( $40^{\circ}\text{C}$ )
- Max Operating Pressure: 232/363 PSI
- Electrical Connection: 3~460v
- IP 55 Enclosure
- Max flows: 250 USGPM
- Max Head: 720 feet

### Materials of Construction

- 3-D Stainless Impellers
- Stainless Steel Volute, Shroud & Shaft



**Greater than NEMA Premium Efficiencies!**



Compatible with IR Device & IF Modules



\*Compared to an uncontrolled pump.

# Wilo Accessories

## IR Device & IF Modules



### IR (Infrared) Device

Infrared (IR) Device  
 Window's based USB device that allows you to communicate with Stratos, D/Z/GIGA & Helix Excel pumps through a laptop via USB connection.

Quick and easy pump commissioning & diagnostic reports.

### IF (Inter-Face) Modules

The Stratos IF-Modules are designed for external control and diagnostics of Wilo high efficiency pumps.

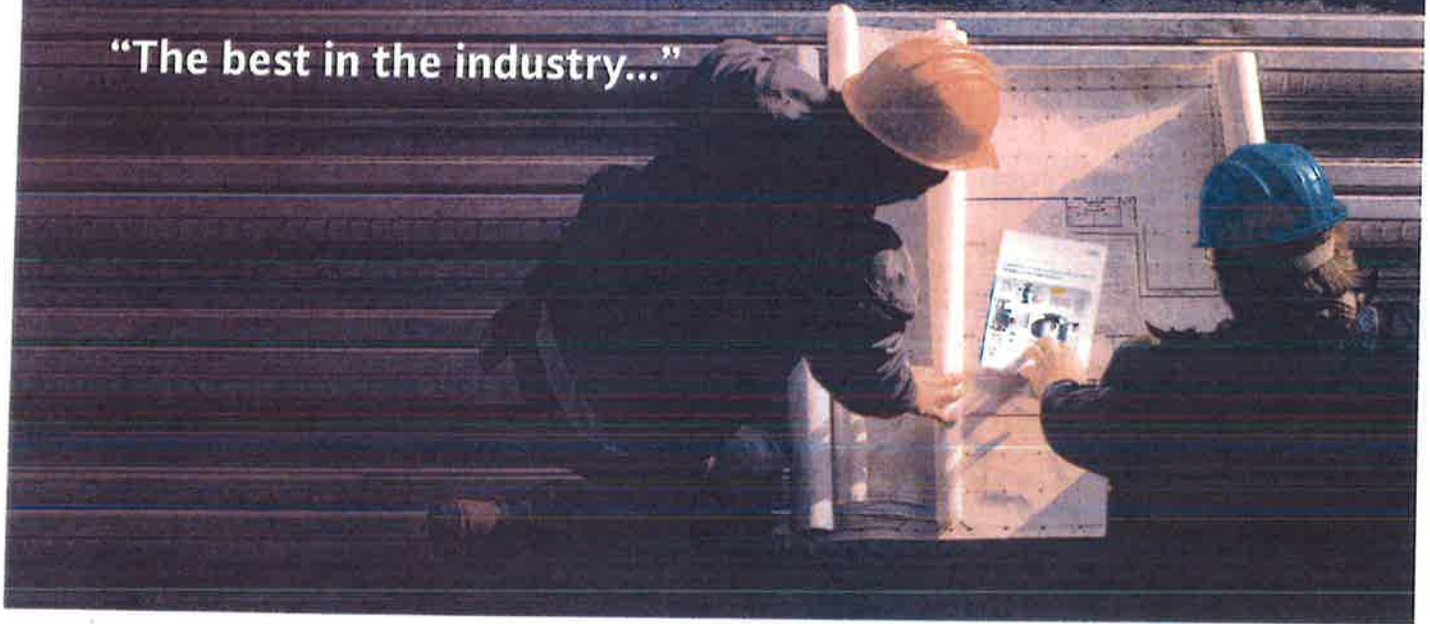


#### Stratos IF Modules

Function/Models	LON	Ext. Off	Ext. Min	SBM	Ext. Off / SBM	BACnet / RS485
Collective run signal output (SBM) as a voltage-free, normally open contacts				X	X	
Input for voltage-free, normally closed contacts with the function Ext. Min			X			
Input for voltage-free, normally closed contacts with the function Ext. Off		X			X	
Control input 0-10 V						
Remote setpoint adjustment		X	X	X		
Remote speed adjustment						
DP interface for dual pump management of 2 single-head pumps	X	X	X	X	X	X
LON interface for link-up to LONWORKS-networks, Transceiver FTT 10 A	X					
BACnet						X

**“Wilo has a four-year warranty on Stratos products?”**

**“The best in the industry...”**



Now you can have the best warranty in the business on Wilo Stratos, Stratos D and Stratos Z high efficiency ECM circulators!

That's right - Our standard warranty on select Stratos products is now 4 YEARS. We are so sure that the Stratos is the last circulator you'll need, that we've doubled the original two year warranty. Drop us a line and join the thousands who rest easy with Wilo!

☎ 888-245-6372 | [www.wilo-usa.com](http://www.wilo-usa.com)



**Wilo-Stratos**



**Wilo-Stratos D**



**Wilo-Stratos Z**

Pioneering for You

**wilo**®

wilo®

**WILO USA LLC**

888-945-6872

[www.wilo-usa.com](http://www.wilo-usa.com)

[info@wilo-usa.com](mailto:info@wilo-usa.com)

**WILO Canada Inc.**

866-945-6236

[www.wilo-canada.com](http://www.wilo-canada.com)

[info@wilo-canada.com](mailto:info@wilo-canada.com)

**WILO Mexico**

452 35 5586 3209

[www.wilo-mx.com](http://www.wilo-mx.com)

[info@wilo.com.mx](mailto:info@wilo.com.mx)

# Gravelle Plumbing & Heating, Inc.

223 - 1st Avenue NW Aitkin, MN 56431 Phone: 218-927-2624 Fax: 218-927-2415

March 8, 2016

Aitkin County HHS

Attention: Bill Thompson

Revised 8-23-16

Project: Boiler replacement

Opt # 2 83%AFUE boiler

Scope:

- Remove existing boiler
- Remove existing pumps
- Supply and install 4 83% packaged unit boilers
- Supply and install both properly sized circ pumps
- Connect to the existing boiler venting
- Connect to the existing gas piping
- Connect to the existing supply and return piping
- Pipe cover on the new installed s&r piping
- City permit "By owner"
- Labor to complete
- Boiler system start up , owner to assist in system filling"
- Note existing control system connection to the new system supplied by the owner

Estimated cost

\$59,850.00

Thank you,

Harlon



8/29/16 - Call Harlon :

X Pretty considerable amount

(#13,650)

15 year →  
make guidance



# Gravelle Plumbing & Heating, Inc.

223 - 1<sup>st</sup> Avenue NW Aitkin, MN 56431 Phone: 218-927-2624 Fax: 218-927-2415

March 8, 2016

Aitkin County HHS

Attention: Bill Thompson

Project: Boiler replacement                      REVISED 8-23-16

Opt # 1 High 94% AFUE boiler

Scope:

- Remove existing boiler
- Remove existing pumps
- Supply and install new 94% AFUE boiler
- Supply and replace both properly sized circ pumps
- Supply and install new boiler venting
- Connect to the existing gas piping
- Connect to the existing supply & return piping
- Pipe cover on the new installed s&r piping
- City permit By "owner"
- Labor to complete
- Boiler system start up , "owner to assist in system filling"
- Note existing control system connection to the new system supplied by owner

Estimated cost

\$73,500.00

Proposal accepted by \_\_\_\_\_ Date \_\_\_\_\_

Thank you,

Harlon

