



# Addendum No.1

Issued: July 31, 2023

RFP Name: Provide and Install Boiler for Christian Ott Elementary School

RFP# 2023-PUR-007

Please include the following in your bid:

- Backnet Cards
- Modulating pumps
- We are changing the primary pumps to variable speed.

The HTP Elite XL has been accepted as a substitution, the architect drawings and other information are attached.



# EliteXL

COMMERCIAL HIGH EFFICIENCY CONDENSING BOILER



## FEATURES:

**4 pass heat exchanger** with large internal circuits reduces pressure drop, allowing the unit to be used in variable flow system

Durable **316L stainless steel** construction pressure rated at 160 PSI bears the ASME Stamp (H)

**10 to 1** turndown

**Three Pump Control** - System, Boiler & DHW

**7" High Resolution Touchscreen Display**

Cascade sequencing up to **8 boilers** – Redundancy of operation (no downtime) – providing a much larger turndown ratio while increasing overall system efficiency and performance with unit runtime rotation

**HTP LINK** - WiFi solution enables remote monitoring of the appliance and system

Direct vent up to 150 feet (1,500,000 to 2,000,000 Btuh Units) and up to 125 feet (399,000 to 1,000,000 Btuh Units) using PVC, CPVC, Polypropylene or Stainless Steel

Units can be Stacked and/or Installed Outdoors with Optional Kits

7 Sizes from  
**399,000 to 2,000,000** Btuh

**97%** Thermal Efficiency

Ultra-Low NOx Operation

**HTP LINK**

SUSTAINABLE COMFORT FOR EVERYONE

 **ARISTON**  
GROUP

# Power You Can Depend On

## EliteXL<sup>®</sup>



399,000 &  
500,000 Btuh

650,000 • 800,000  
& 1,000,000 Btuh

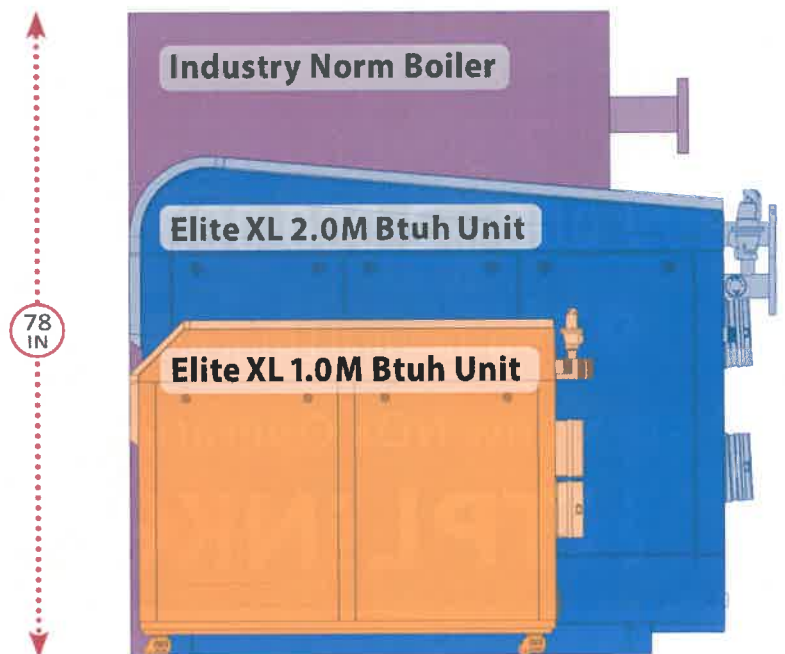
1,500,000 &  
2,000,000  
Btuh\*

\*2,000,000 Btuh Model Shown

## 7 Sizes: 399,000 Btuh to 2,000,000 Btuh

### Contractor Approved Sizing!

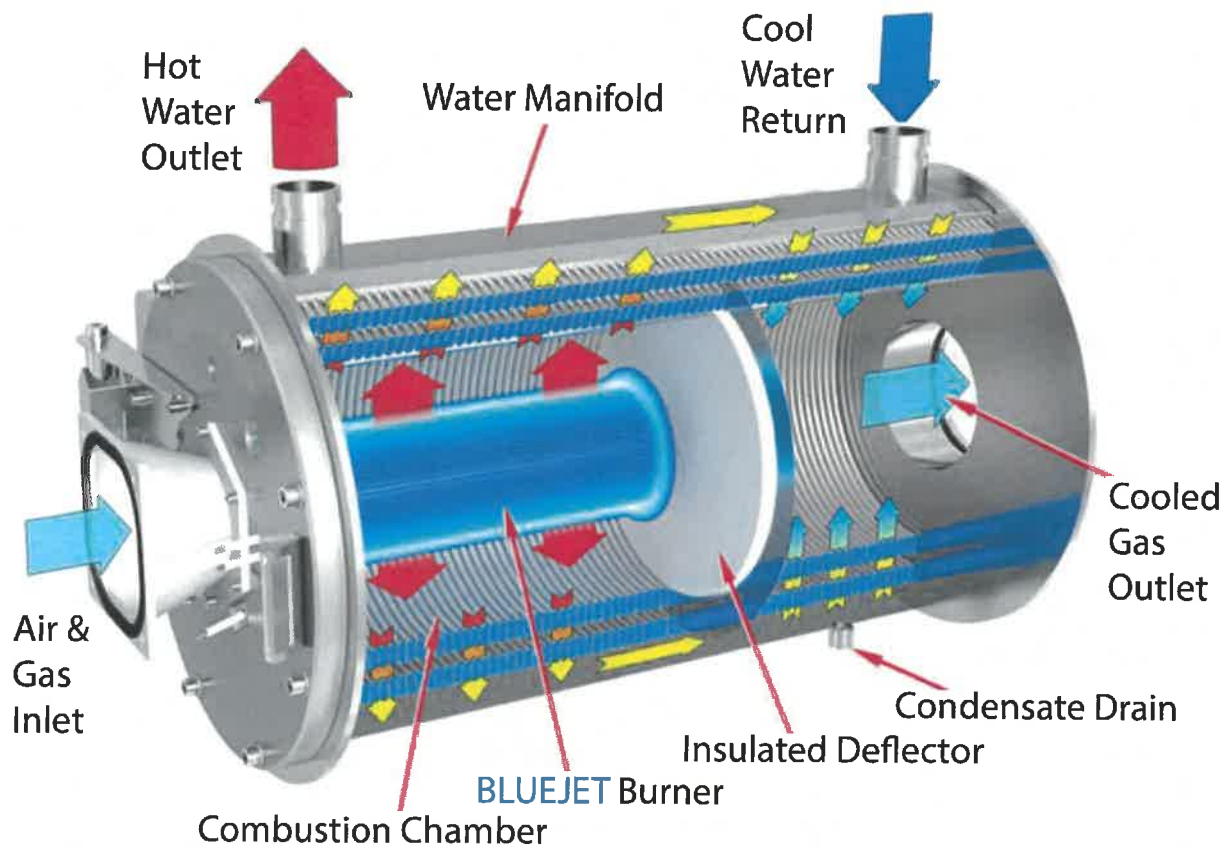
Space should never be compromised to obtain a desired output. The HTP high efficiency Elite XL Boiler was engineered with contractor accessibility in mind. This powerful boiler has a 4 pass heat exchanger designed to increase heat transfer while allowing for a small footprint. Compared with the industry norm, the Elite XL's size advantage makes installation in smaller spaces a reality.



The Industry Norm VS Our 2 Million Btuh Unit VS Our 1 Million Btuh Unit

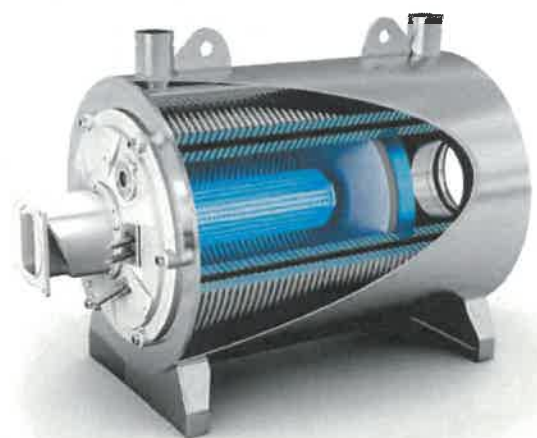
# EliteXL<sup>®</sup>

## A CLOSER LOOK



## Why BLUEJET?

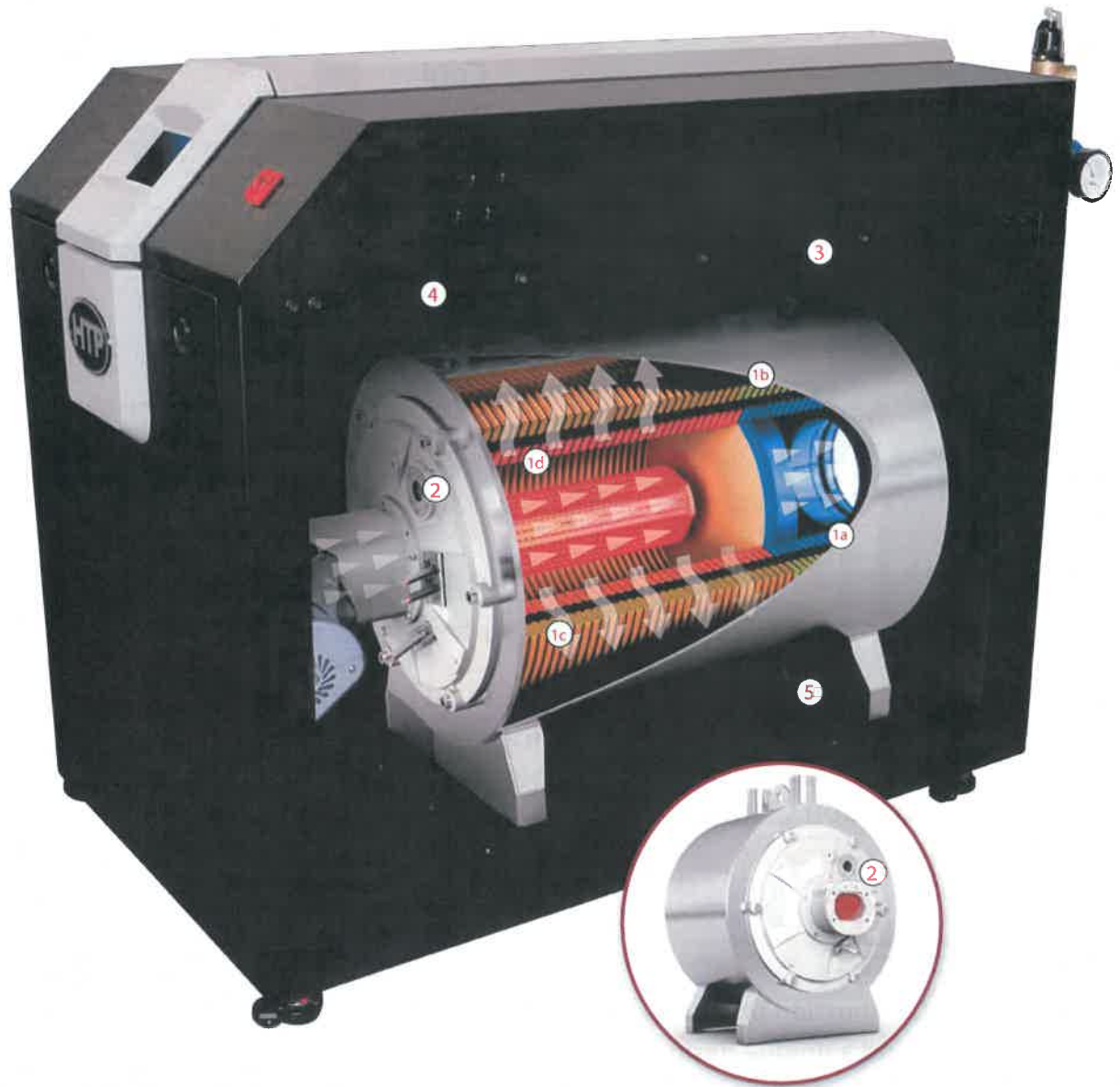
Patented Blue Jet Combustion burner technology, low NOX operation and a unique design provide a uniform stable flame for years of trouble-free operation, while avoiding clogging and hot spots normally seen on other premix burners.



- Quality Stainless Steel Heat Exchanger
- The Highly Efficient 4 Pass Heat Exchanger Design Multiplies the Heat Transfer
- Reduced Pressure Drop Allows Variable Flow Systems to be Used, Reducing Installation Cost of Primary / Secondary System



# EliteXL<sup>®</sup> A LOOK INSIDE



- 1** The 4 Pass Heat Exchanger Design Multiplies the Heat Transfer:
- 1a** - The hydronic heating fluid-return makes the 1st pass, heating up, in the inner stainless steel tubes of the condensing chamber.
  - 1b** - The hydronic heating fluid makes the 2nd pass, picking up even more heat in the outer-tubes of the exhaust chamber.
  - 1c** - The hydronic heating fluid makes the 3rd pass, multiplying the heat in the outer-tubes of the burner chamber.
  - 1d** - The hydronic heating fluid makes the 4th and final pass, on the hydronic supply, maximizing the heat in the inner-tubes of the burner chamber.

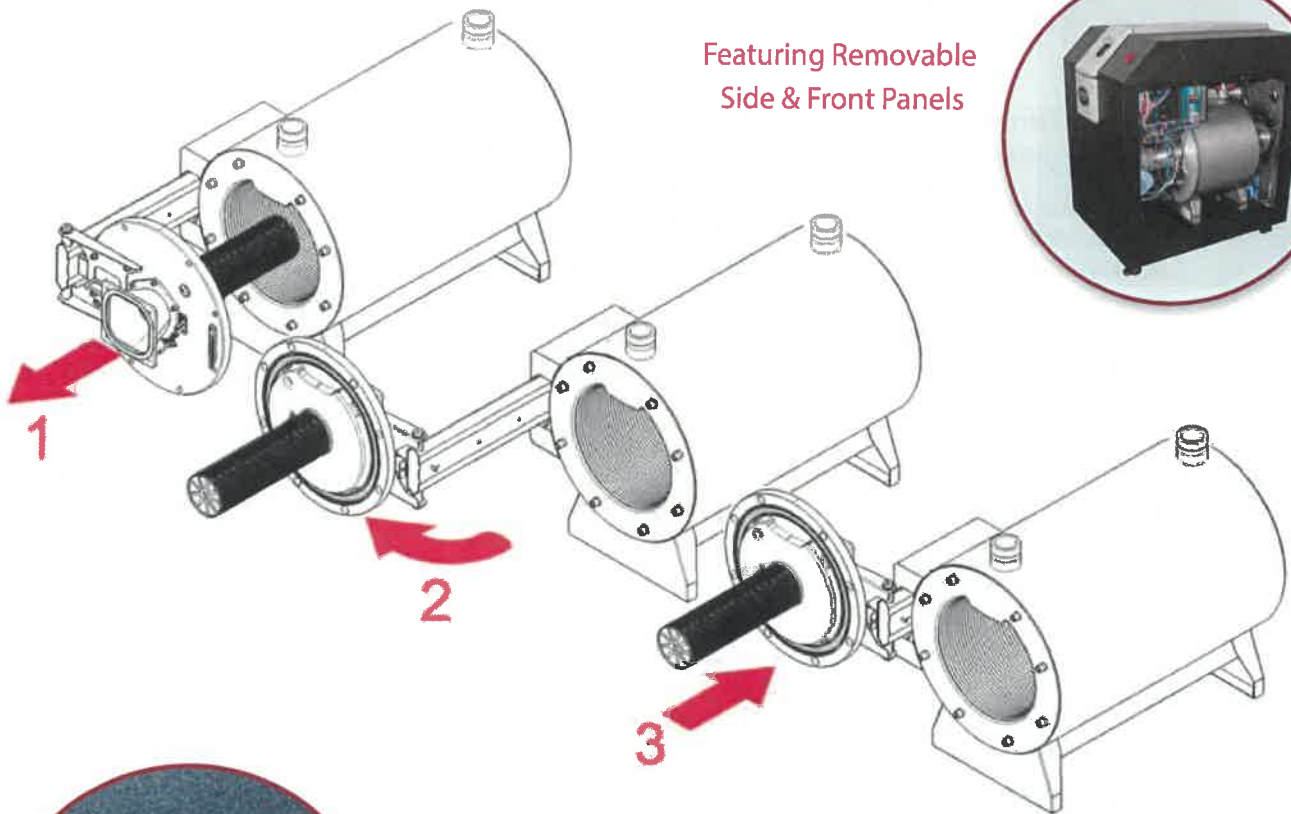
- 2** Burner Sight Glass
- 3** Hydronic Return
- 4** Hydronic Supply
- 5** Condensate Drain

# MAKING SERVICEABILITY EASIER

Our talented team of design engineers oversaw every aspect of the Elite XL. 1,500k to 2,000k Btuh models include a combustion assembly with a unique hinged sliding door, which is ideal for complete access when maintenance is necessary. In 3 easy steps the combustion assembly is accessible. Simply slide, swing and secure.



Featuring Removable Side & Front Panels



1. Slide 2. Swing 3. Secure



Moves Easily

Footmaster wheels on the 399K - 1,000K models eases moving the boiler and locking it in place

# HTP LINK

Multiple Platforms on the Cloud

## Technical Support

Remotely link to a factory technician to assist in system monitoring, troubleshooting and overall system efficiency.



## Building / Property Manager

Remotely link to monitor multiple units in multiple locations. Get text and email alerts to critical system events such as faults. Continuous system monitoring optimizes system performance and efficiency.



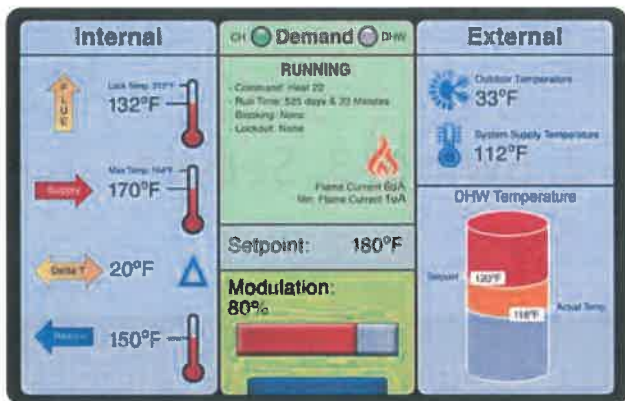
## Contractor / Maintenance

Receive text and email notifications and remotely link to assist the customer with system issues. Get key information to quickly and efficiently troubleshoot before arriving on the job.



## The HTP Link Touch Display

Take Total Control of Your Heating System



Each boiler comes with a **High Resolution Touchscreen**

## TOUCHSCREEN DISPLAY

7" High Resolution color touchscreen display provides clear visual monitoring of the unit's parameters and programming to maximize the efficiency of the unit. Display screen color will change to help clearly identify the status of the unit, making monitoring and troubleshooting easy.

- Stand-By/Running (Green Color)
- Fault (Red Color)
- Blocking Code (Yellow Color)



Model Number	Input Max (MBH)	Input Min (MBH)	Turndown	TE %	Water Pressure Drop (Ft-Hd)/Flow (GPM)		
					40 F ΔT	30 F ΔT	20 F ΔT
ELX-400FBN	399	39	10:1	97	4 Ft @ 19 GPM	7.2 Ft @ 26 GPM	12 Ft @ 39 GPM
ELX-500FBN	500	50	10:1	97	3.2 Ft @ 24 GPM	5.4 Ft @ 32 GPM	11.4 Ft @ 48 GPM
ELX-650FBN	650	65	10:1	97	4 Ft @ 31 GPM	6.2 Ft @ 42 GPM	11.5 Ft @ 63 GPM
ELX-800FBN	800	80	10:1	97	3 Ft @ 39 GPM	6 Ft @ 52 GPM	12 Ft @ 77 GPM
ELX-1000FBN	1000	100	10:1	97	4.7 Ft @ 48 GPM	7 Ft @ 64 GPM	14 Ft @ 96 GPM
ELX-1500FBN	1500	150	10:1	97	4.7 Ft @ 73 GPM	7.6 Ft @ 97 GPM	16 Ft @ 146 GPM
ELX-2000FBN	2000	200	10:1	97	6.7 Ft @ 100 GPM	11.5 Ft @ 133 GPM	21 Ft @ 200 GPM

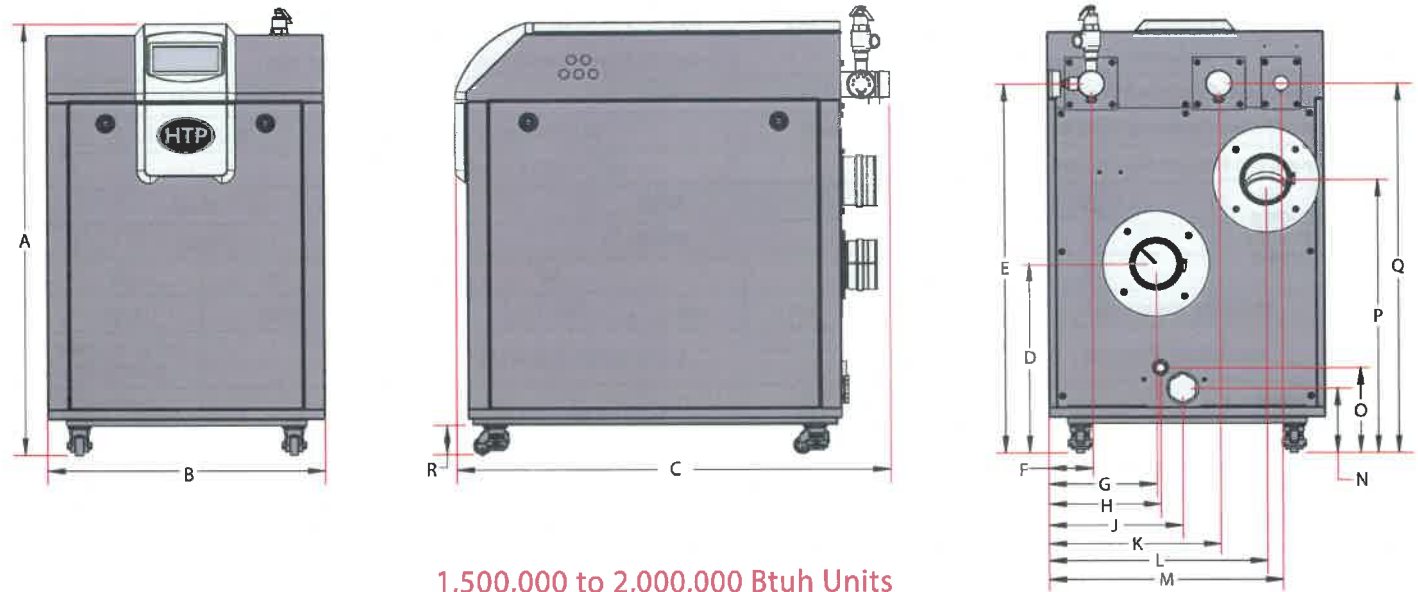
Model ELX-		400FBN	500FBN	650FBN	800FBN	1000FBN	1500FBN	2000FBN
<b>Installation</b>		Indoor, Floor Standing, Fully Condensing						
<b>Minimum / Maximum Input (Btu/Hr)</b>		39,900 / 399,000	50,000 / 500,000	65,000 / 650,000	80,000 / 800,000	100,000 / 1,000,000	150,000 / 1,500,000	200,000 / 2,000,000
<b>Heating Capacity (MBH)</b>		387	485	630	776	970	1,455	1,940
<b>Flue System</b>		Category IV, Sealed Combustion Direct Vent, Power Vent						
<b>Minimum Combined Vent Run</b>		10 feet					15 feet	
<b>Maximum Combined Vent Run</b>		4" (125 feet)		6" (125 feet)			8" (150 feet)	
<b>Approved Exhaust Vent Materials</b>		PVC, CPVC, PP, Stainless Steel						
<b>Packaging Dimensions (in Inches)</b>	<b>W</b>	32.25					43.25	
	<b>H</b>	49.625					64.25	
	<b>D</b>	48	64			76	86	
<b>Shipping Weight (lbs)</b>		538	545	680	700	745	1400	1750
<b>Gas Supply Pressure</b>		3.5" to 14" WC (NG or LP)						3.5" to 10.5" WC (NG ONLY)
<b>Manifold Pressure</b>	<b>Min / Max</b>	-0.08" WC (NG or LP)						-0.07" WC (NG ONLY)
<b>Power Supply</b>		120V 60 Hz, 21.3A						208/3PH WYE, 60Hz, 15A/Leg
<b>Customer Connection Board Fuse Amperage Ratings</b>		2 Amps						5 Amps
<b>General Operating Conditions</b>		Minimum Ambient Temperature: 32°F (0°C) Product Approvals and Requirements: ANSI Z21.13 / CSA 4.9, CSD-1 ASME Code						
<b>Ignition System</b>		Direct Electronic Spark Ignition / Flame Rectification						
<b>Burner System</b>		Premixed Fuel Modulation / Stainless Steel Burner						
<b>Gas Valve System</b>		Pneumatic Gas Valve						
<b>Dimensions (in Inches)</b>	<b>W</b>	26					31.8	
	<b>H</b>	41					60.8	
	<b>D</b>	40.7	56.5			66.5	79	
<b>Boiler Water Content (Gallons)</b>		3.8	4.3	5.6	6.6	8.1	12.9	16.25
<b>Minimum Flow Rate @ 20°F ΔT at Low Fire (GPM)</b>		4	5	6.5	8	10	15	20
<b>Flow Switch Activation (GPM)</b>		4					9	
<b>Boiler Setpoint Temperature Range</b>		50 – 190°F / 32 - 190°F (with Outdoor Reset Curve)						
<b>DHW Indirect Setpoint Temperature Range</b>		70 – 185°F						
<b>Water Pressure (PSI)</b>	<b>Heat Exchanger MAWP</b>	160						
	<b>Pressure Relief Valve</b>	50						
<b>Control Panel</b>		7" Full Color Touch Screen						
<b>Main Controller</b>		928 SIT Control						
<b>Connection Sizes</b>	<b>Supply / Return</b>	2" NPT					2 1/2" Flange	
	<b>Gas Inlet</b>	1" NPT		1 1/4" NPT			1 1/2" NPT	2" NPT
<b>Materials</b>	<b>Cabinet</b>	Powder Coated Galvaneal Steel						
	<b>Heat Exchanger</b>	316L Stainless Steel Water Tube						
<b>Safety Devices</b>		Flame Rectifier Probe, Dual Water Supply Temperature Sensor / High Limit (210°F), Freeze Protection, Condensate Trap with Float, Dual Flue Sensor (210°F), Blocked Vent Pressure Switch, Internal UL 353 Approved Low Water Cut-Off (LWCO), High Resolution Flow Switch						



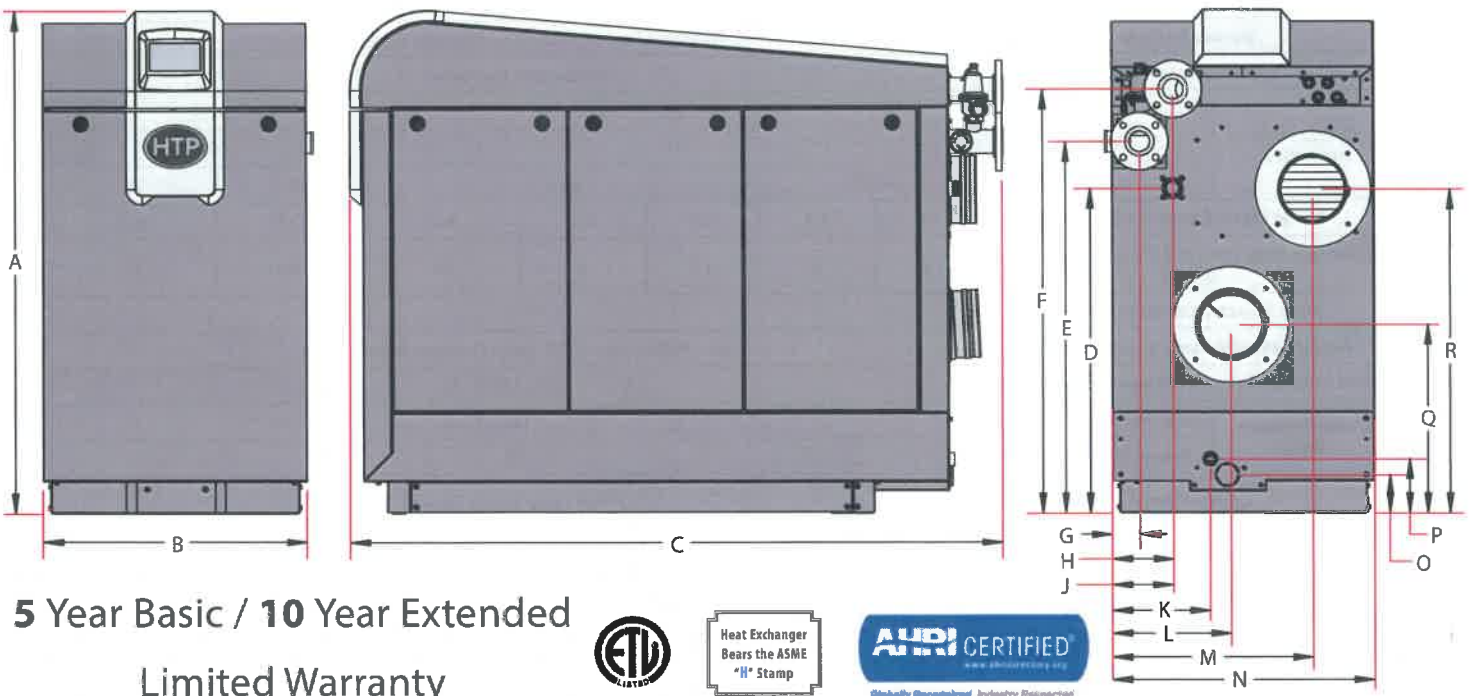
Model	Water Connection	Vent Size	Air Intake	Gas Connection	Condensate
ELX-400FBN - ELX-500FBN	2" NPT	4"	4"	1"	3/4" PVC
ELX-650FBN		6"	6"	1"	
ELX-800FBN - ELX-1000FBN				1-1/4"	
ELX-1500FBN	2 1/2" Flange	8"	8"	1 1/2"	1" PVC
ELX-2000FBN				2"	

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R
ELX-400FBN - ELX-500FBN	41.0	26.0	40.7	17.9	35.0	4.1	10.1	10.5	12.6	16.1	20.5	22.0	6.1	8.1	25.8	35.0	2.8*
ELX-650FBN - ELX-1000FBN			56.5														
ELX-1500FBN	60.8	31.8	66.5	39.2	44.8	51.2	3.4	7.4	7.5	11.9	14.4	24.4	31.8	4.6	6.5	22.7	39.1
ELX-2000FBN			79.0														

399,000 to 1,000,000 Btuh Units

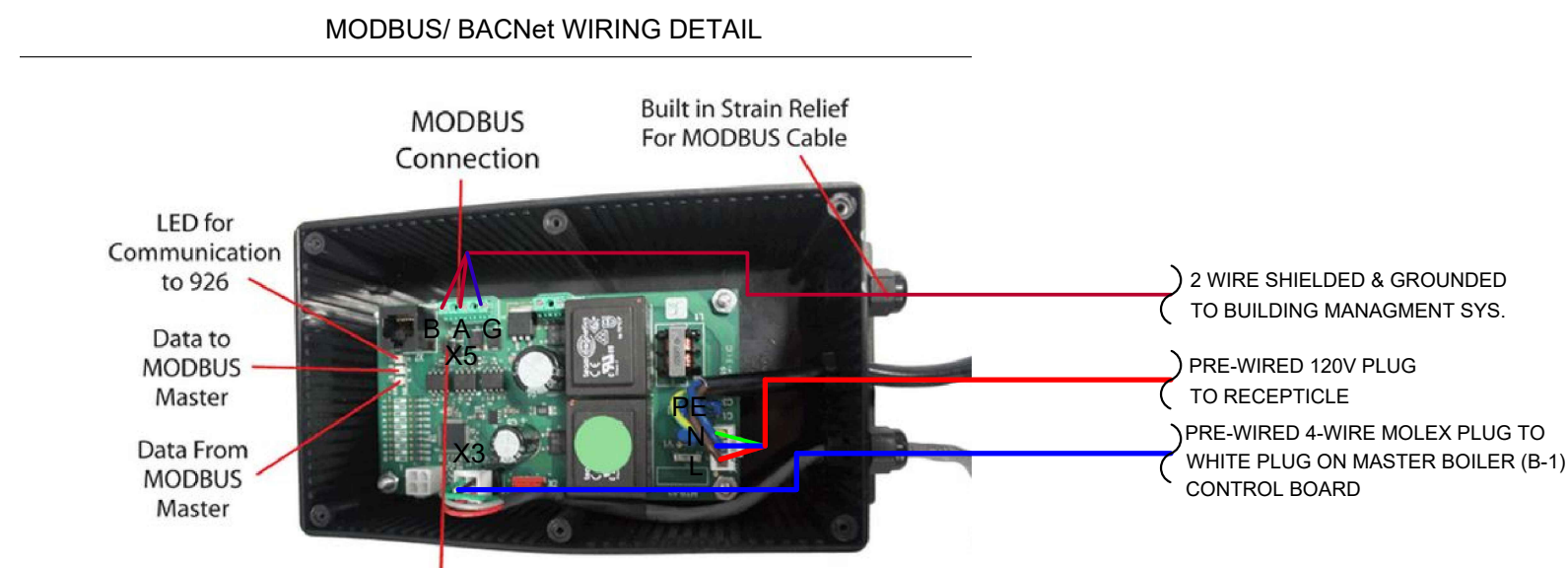
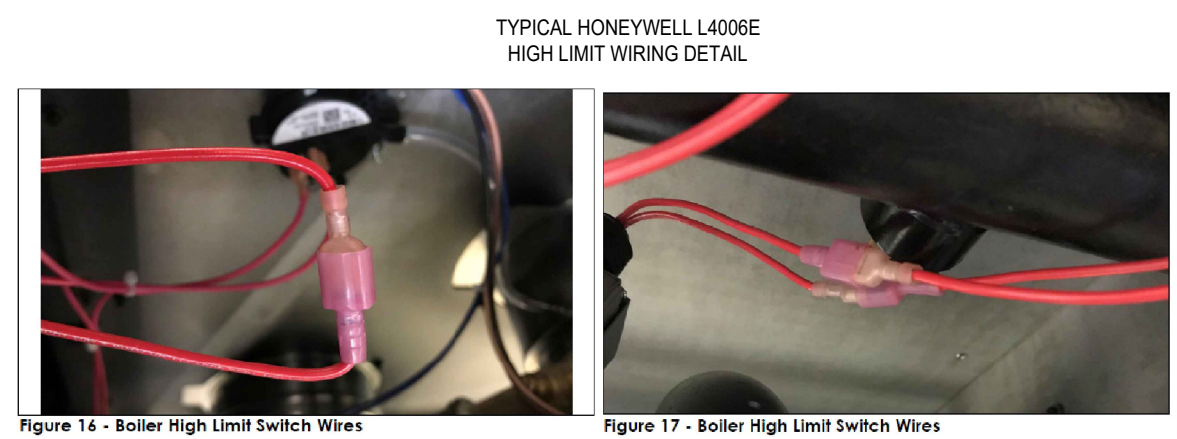
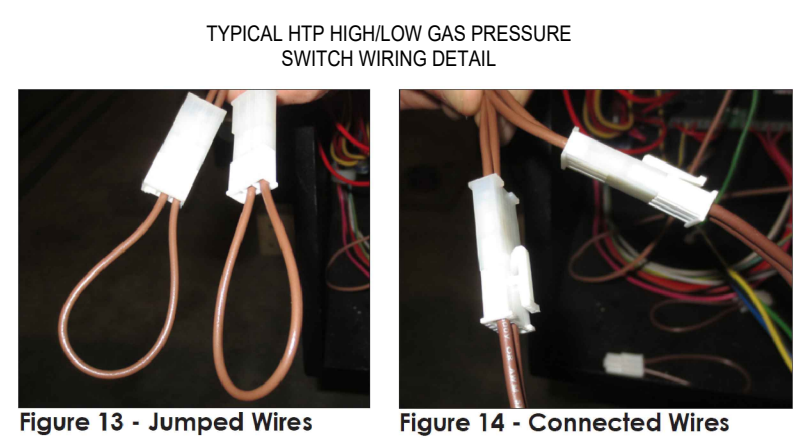
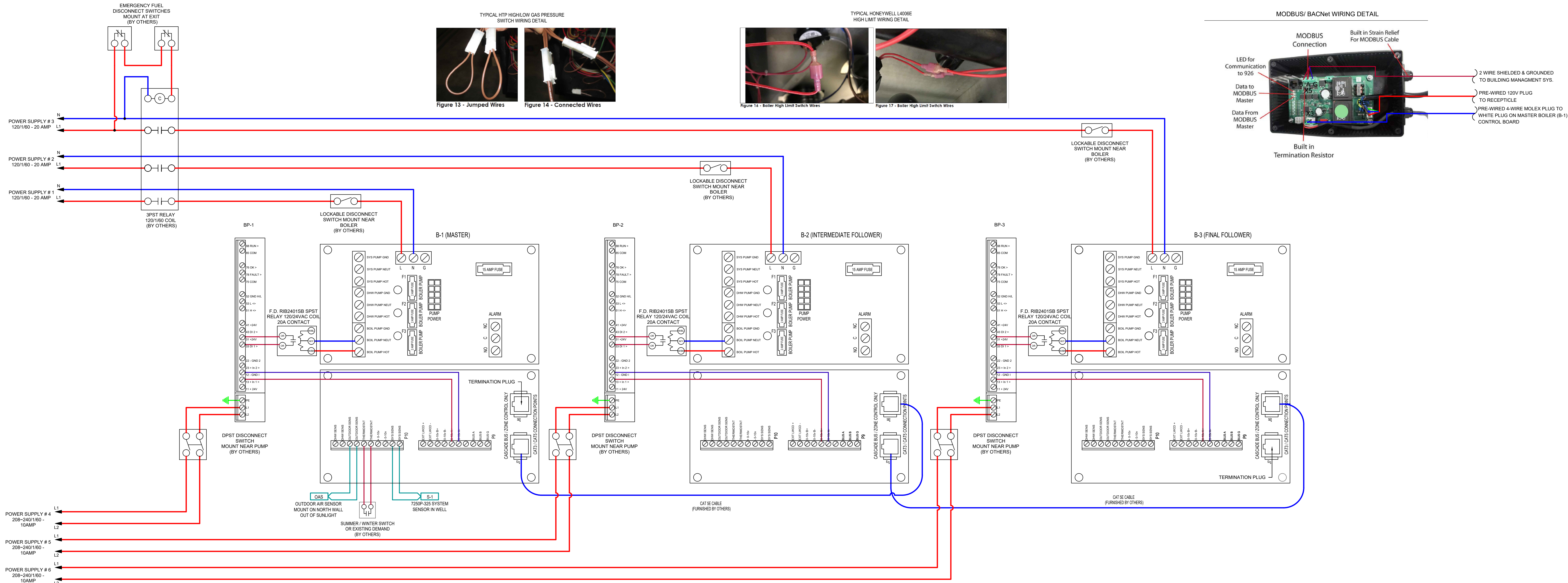


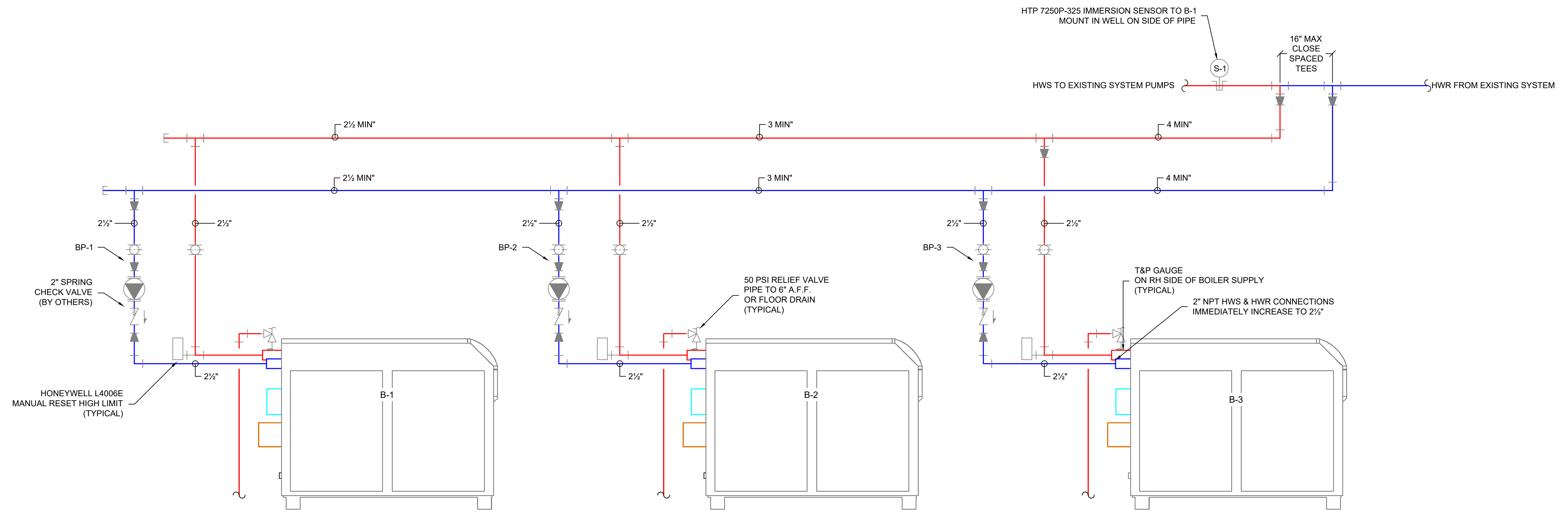
1,500,000 to 2,000,000 Btuh Units



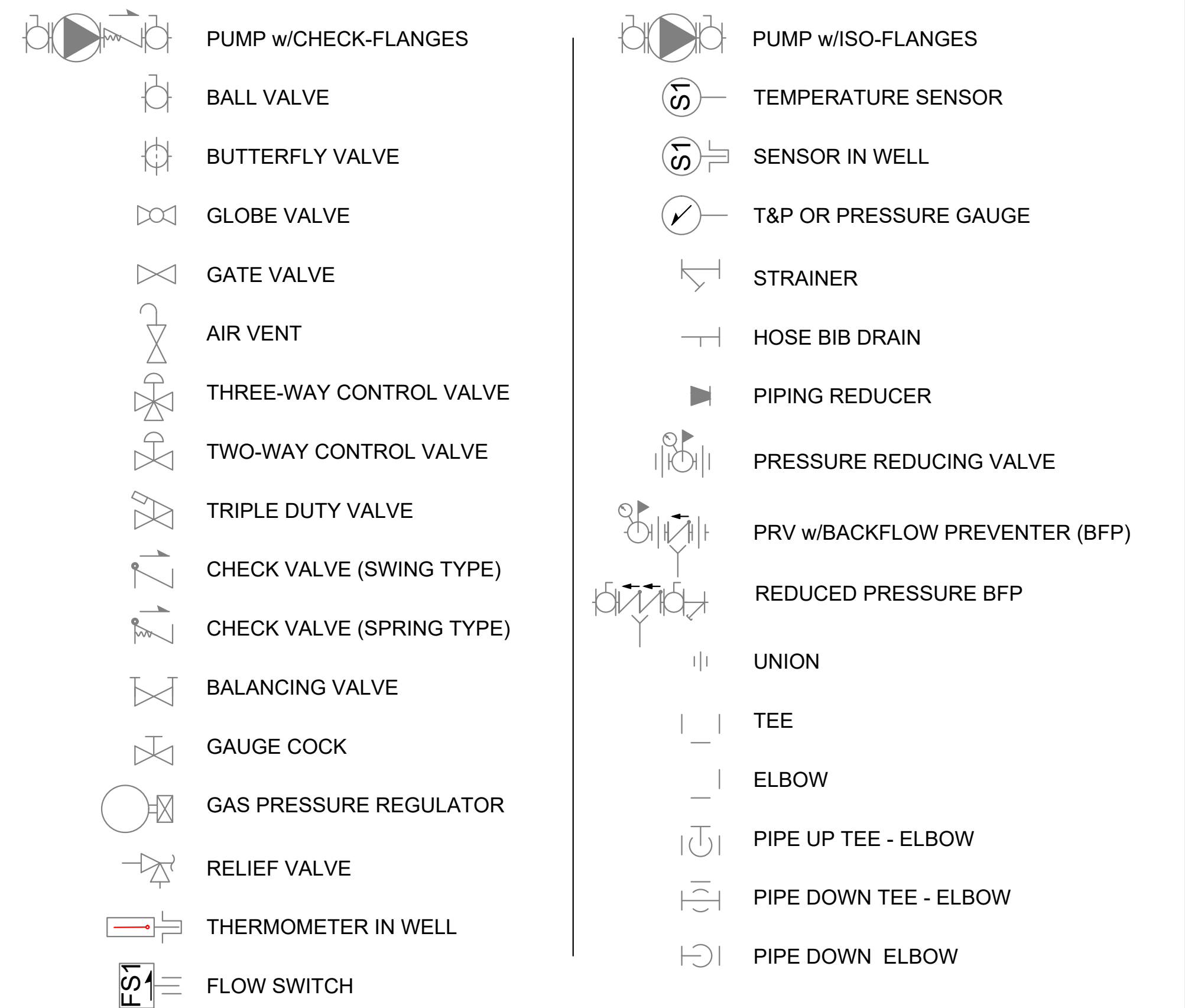
5 Year Basic / 10 Year Extended  
Limited Warranty



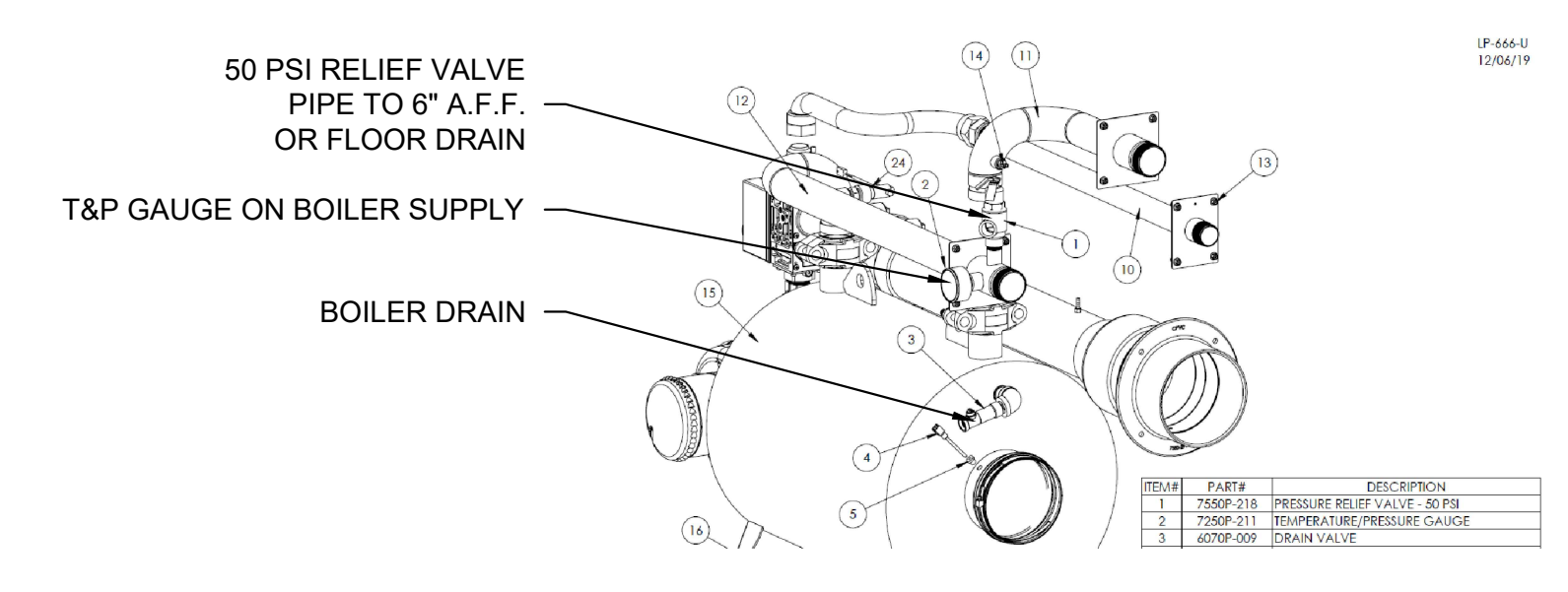




### PIPING LEGEND



### HWS / HWR FLOW PIPING DIAGRAM





Pioneering for You

wilo

*Product brochure*

# WILO-STRATOS MAXO

## THE FUTURE IS CONNECTED.

New series!





## One-click commissioning: easier than ever before.

Intuitive operation: The Wilo-Stratos MAXO impresses with application-guided configuration using the *settings assistant*, a new display and the operating button with Green Button Technology. This provides outstanding ease of use on commissioning. The Wilo-Stratos MAXO also enables convenient control and operation using the Smart Connection function in the Wilo-Assistant app, which can be accessed by smartphone or tablet.

### COMMISSIONING ADVANTAGES IN DETAIL:

- One-click commissioning using the factory settings (Heating – Radiator – Dynamic Adapt plus)
- Settings assistant: application-based setting of the pump function (guided selection of correct control function)
- Intuitive user interface with preview function and application-based default settings
- Large display with high resolution and very good legibility

# Intelligent communication with maximum connectivity.



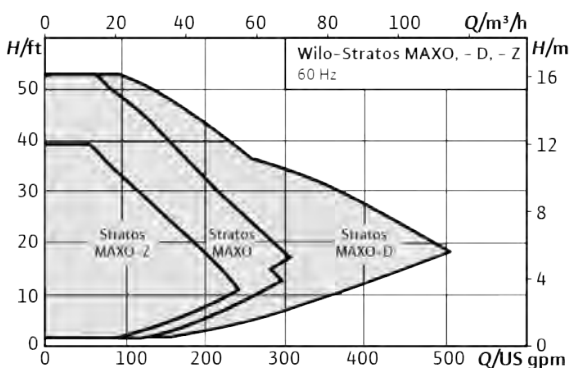
From integration in building automation to control using the app, Wilo ensures comprehensive communication capability with intelligent and smart technologies. We provide you with smart connections to your pumps and pump systems and give you an overview of installation sites and operating conditions while you are on the go. You can check different configurations and observe systems while you are on the road. That way, you make the best possible use of the digital dynamics and maintain control at all times – anytime and anywhere, as if you were on site.

This also applies to existing Wilo pumps, as we modernise tried-and-tested high-efficiency pumps using digital extensions for the connectivity of the future. What this means for you is even greater convenience, thanks to control and data retrieval via your mobile phone or tablet.



## PRODUCT ADVANTAGES:

- Intuitive operation through application-guided setting using the settings assistant combined with a new display and operating button with Green Button Technology
- Maximum energy efficiency thanks to the combination of optimised and innovative energy-saving functions (e. g. No-Flow Stop)
- Optimum system efficiency thanks to new intelligent control functions, such as Dynamic Adapt plus, Multi-Flow Adaptation, T-const. and  $\Delta T$ -const.
- The latest communication interfaces (e. g. Bluetooth) for connecting to mobile terminal devices and direct pump networking using Wilo Net for multiple pump control
- Maximum convenience for electrical installation owing to the clearly arranged and spacious terminal room and the optimised Wilo-Connector
- Use of the Wilo-Stratos MAXO-Z ensures optimum hygiene support thanks to its thermal disinfection detection



Technical data	
Equipment/performance	Wilo-Stratos MAXO/-D/-Z
Drive system	EC motor with integrated electronic power adjustment
Delivery head $H_{\max}$	52.49 ft
Volume flow $Q_{\max}$	281 gpm (single pump) 240 gpm (drinking water pump) 493 gpm (twin-head pump)
Control	<ul style="list-style-type: none"> <li>→ Dynamic Adapt plus: independent power adjustment without manual setpoint specification</li> <li>→ Constant temperature: T-const.</li> <li>→ Constant differential temperature: <math>\Delta T</math>-const.</li> <li>→ Multi-pump system: Multi-Flow Adaptation</li> <li>→ Constant volume flow: Q-const.</li> <li>→ Index circuit evaluator</li> <li>→ User-defined PID control: PID</li> <li>→ Constant differential pressure: <math>\Delta p</math>-c</li> <li>→ Variable differential pressure: <math>\Delta p</math>-v</li> <li>→ Constant speed: n-const.</li> </ul>
Functions	<ul style="list-style-type: none"> <li>→ Configurable volume flow limitation via <math>Q_{\text{limit}}</math> function (<math>Q_{\text{min}}</math> and <math>Q_{\text{max}}</math>)</li> <li>→ No-Flow Stop (automatic deactivation of the pump)</li> <li>→ Pump venting function for automatic venting of the rotor chamber</li> <li>→ Switchover between heating and cooling mode (automatic and manual)</li> <li>→ Separate heating/cooling quantity measurement</li> <li>→ Automatic setback operation</li> <li>→ Automatic deblocking function and integrated full motor protection</li> <li>→ Dry run detection</li> <li>→ Thermal disinfection detection (Stratos MAXO-Z only)</li> <li>→ Operating modes of twin-head pumps: Main/standby operation, parallel operation (efficiency-optimised double pump management)</li> </ul>
Display	Illuminated full graphic 4.2-inch colour display
Electrical connection Wilo-Connector	1-230 V, 50/60 Hz
Protection class	IPX4D
Fluid temperature range	Wilo-Stratos MAXO/-D: 14 °F to 230 °F Wilo-Stratos MAXO-Z: 32 °F to 176 °F up to 3.57 mmol/l (20 °dH)
Thermal insulation shell	Single pumps equipped with thermal insulation as standard
Energy efficiency index (EEI)	$\leq 0.17$ to $\leq 0.19$
Optional accessories	<ul style="list-style-type: none"> <li>→ Screwed connections for threaded connection</li> <li>→ Counter flange (DN 32 to DN 100)</li> <li>→ Adapter fittings</li> <li>→ ClimaForm Stratos MAXO</li> <li>→ PT1000 sensors</li> <li>→ Differential pressure sensor</li> <li>→ Wilo CIF modules: Modbus RTU, BACnet MS/TP, LON, PLR</li> </ul>

# Wilo-Stratos MAXO

## High-Efficiency Smart Circulators



### Applications:

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

### Features & Benefits

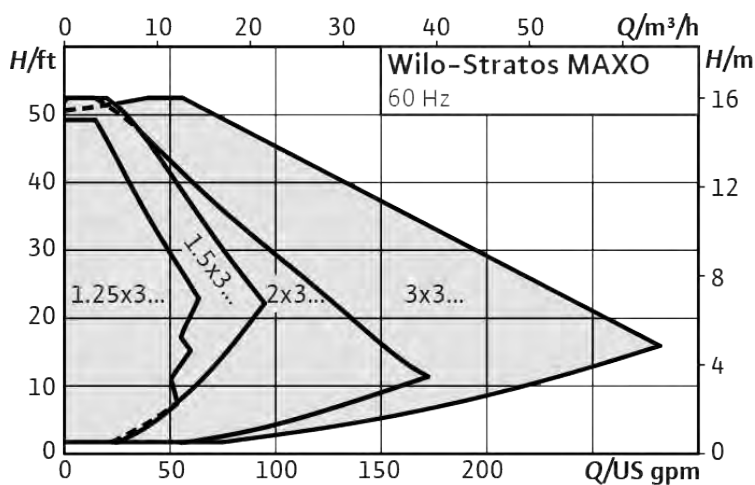
- Green Button Technology with 7" LED color touchscreen display
- Maximum energy efficiency
- New and innovative intelligent control functions, such as Dynamic Adapt plus, Multi-Flow Adaptation, T-const. and  $\Delta T$ -const.
- Bluetooth for connection to mobile devices and direct pump networking for multiple pump via Wilo Net.
- Easy electrical installation

### Technical Data

- Temp Range: 14 °F to 230 °F (-10 °C to +110 °C)
- Electrical Connection: 1~230v
- Protection class IPX4D
- Max. Flow:** 281 gpm
- Max. Head:** 52 ft.

### Materials of Construction

- Gray Cast Iron with Cathaphoretic coating
- Thermal Insulation: Polypropylene
- Stainless Steel Shaft
- Carbon Bearing
- Plastic Impeller





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

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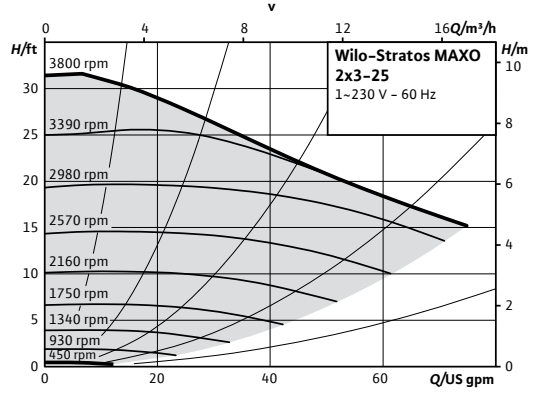
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[info@wilo-canada.com](mailto:info@wilo-canada.com)

Pioneering for You



Wilo-Stratos MAXO

		Project:					
		Engineer:					
		Contractor:					
		Submitted By:			Date:		
		Approved By:			Date:		
Tag #	Model #	Flow	Head	Control Mode	Cycle	Phase	Voltage
	Maxo 2x3-25				60Hz	1~	230-240V



**Product Info**

Brand	Wilo
Product Description	Stratos MAXO 2x3-25
Article Number	2164614
Net Weight (approx.)	40 lbs

**Materials**

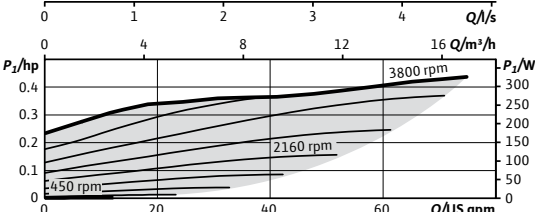
Pump Housing	EN-GJL-250
Impeller	PPS-GF40
Shaft	X30Cr13
Bearing	Carbon, antimony-impregnated

**Hydraulic Data**

Max Operating Pressure PN	145 PSI
Min. Suction Head (122°F)	7.1 PSI
Min. Suction Head (203°F)	17.1 PSI
Min. Suction Head (230°F)	25.6 PSI
Min. Fluid Temp.	14°F
Max Fluid Temp.	230°F
Min. Ambient Temp	14°F
Max. Ambient Temp	104°F

**Motor Data**

Mains Connection	1~230-240 V ±10%, 50/60Hz
Motor Type	ECM
Rated Power P <sub>2</sub>	0.38 hp
Min. Speed n <sub>min</sub>	450 RPM
Max. Speed n <sub>max</sub>	3800 RPM
Power Consumption P <sub>1,max</sub>	0.437 hp
Power Consumption P <sub>1,min</sub>	0.013 hp
Max Current (1~230V) I <sub>max</sub>	1.44 A
Min Current (1~230V) I <sub>min</sub>	0.2 A
Insulation Class	F
Protection Class	Enclosure 2



**CIF Module Selection**

- BACnet MS/TP
- Modbus RTU
- CANopen
- LON TP/FT-10
- PLR

**Accessory Selection**

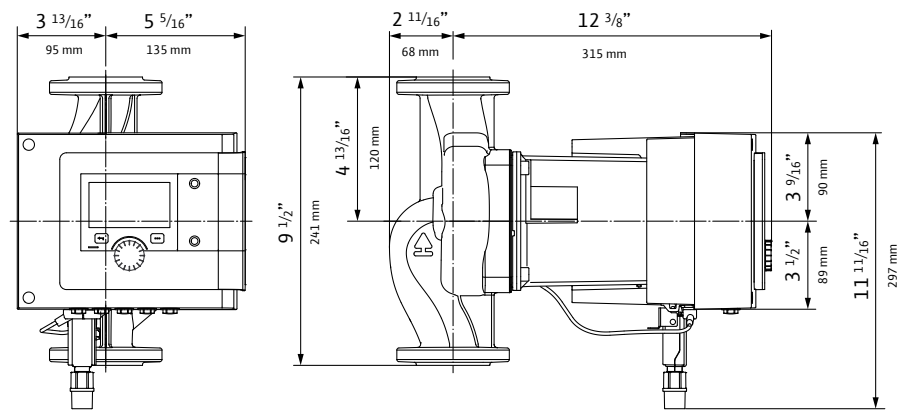
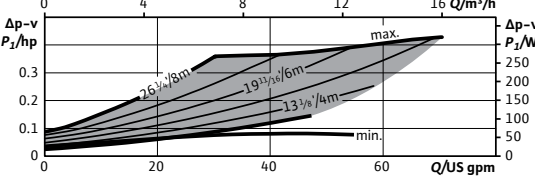
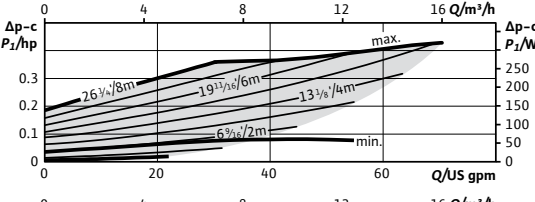
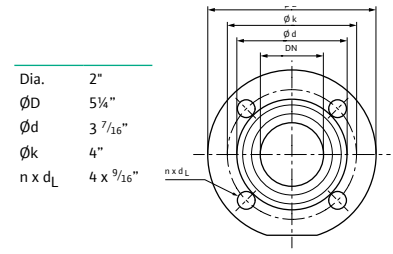
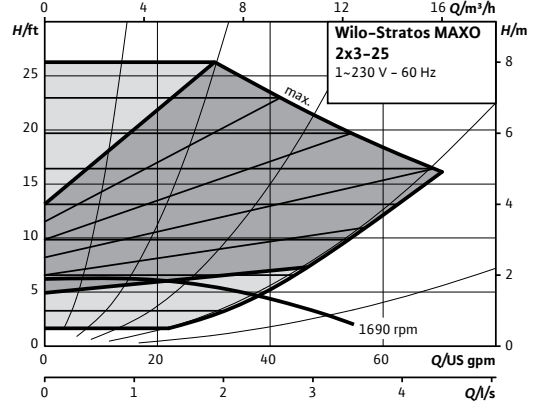
- Immersion Temp. Sensor PT 1000 AA
- Immersion Sleeve G 1/2", 45mm
- Pipe Surface Contact Sensor PT 1000 B
- Immersion Sleeve G 1/2", 100mm

**Electrical Inputs**

Analog Inputs (2x)	0-10V / 0-20mA / 4-20mA / PT 1000 Passive/Active +24V DC
Digital Inputs (2x)	Ext Off / Ext Min / Ext Max / Ext. MANUAL (BMS off) / External Key Lock / Switch heating, cooling
Wilo NET	Multi-Pump Communication
SSM	Fault Signal
SBM	Run Signal

**Installation Dimensions**

Pipe Connection (discharge)	2"
Pipe Connection (suction)	2"
Flange to Flange	9 1/2"



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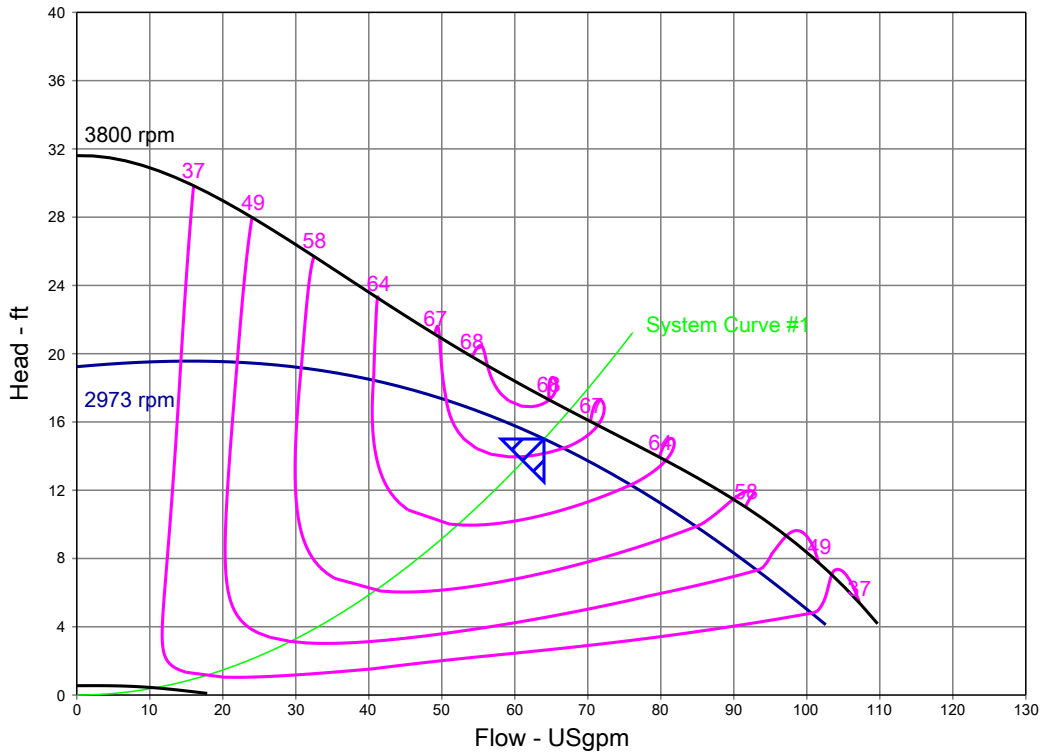


Customer :  
Reference :

**Pump Performance Datasheet**  
Wilco Quotation System 22.4.0

Item number	: ELX-1000 30TD ECM	Size	: Stratos-MAXO 2x3-25 1~230V
Service	: Primary Boiler Loop Pump	Stages	: 1
Quantity	: 1	Based on curve number	: Maxo 2x3-25
Quote number	: 929343	Article Number	: 2164614
		Date last saved	: 12 Nov 2022 9:54 AM

Operating Conditions		Liquid	
Flow, rated	: 64.00 USgpm	Liquid type	: Water
Head, rated (requested)	: 15.00 ft	Additional liquid description	:
Head, rated (actual)	: 15.01 ft	Solids Diameter, required / pump max	: 0.00 in / 0.00 in
Suction pressure, rated / max	: 0.00 / 0.00 psi.g	Solids concentration, by volume	: 0.00 %
NPSH available	: Ample	Temperature	: 68.00 deg F
Site Supply Frequency	: 60 Hz	Fluid density	: 1.000 / 1.000 SG
		Viscosity	: 1.00 cP
		Vapor pressure, rated	: 0.34 psi.a
Performance		Material	
Speed criteria	: Synchronous	Material selected	: Standard
Speed	: 2973 rpm		
Speed, maximum	: 3800 rpm	Pressure Data	
Speed, minimum	: 500 rpm	Maximum working pressure	: 8.47 psi.g
Total efficiency	: 67.41 %	Maximum allowable working pressure	: N/A
NPSH required / margin required	: - / 0.00 ft	Maximum allowable suction pressure	: N/A
Ns (imp. eye flow) / Nss (imp. eye flow)	: 3,275 / - US Units	Hydrostatic test pressure	: N/A
MCSF	: -	Driver & Power Data (@Max density)	
Head maximum, rated speed	: 19.57 ft	Driver sizing specification	: Rated power
Head rise to shutoff	: 28.16 %	Margin over specification	: 0.00 %
Flow, best eff. point	: 58.75 USgpm	Service factor	: 2.00 (used)
Flow ratio, rated / BEP	: 108.94 %	Power, hydraulic	: 0.24 hp
Speed ratio (rated / max)	: 78.24 %	Total power, rated	: 0.36 hp
Head ratio (rated speed / max speed)	: 85.99 %	Total power, max, rated diameter	: 0.37 hp
Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]	: 1.00 / 1.00 / 1.00 / 1.00	Motor rating	: 0.38 hp / 0.28 kW
Selection status	: Acceptable		

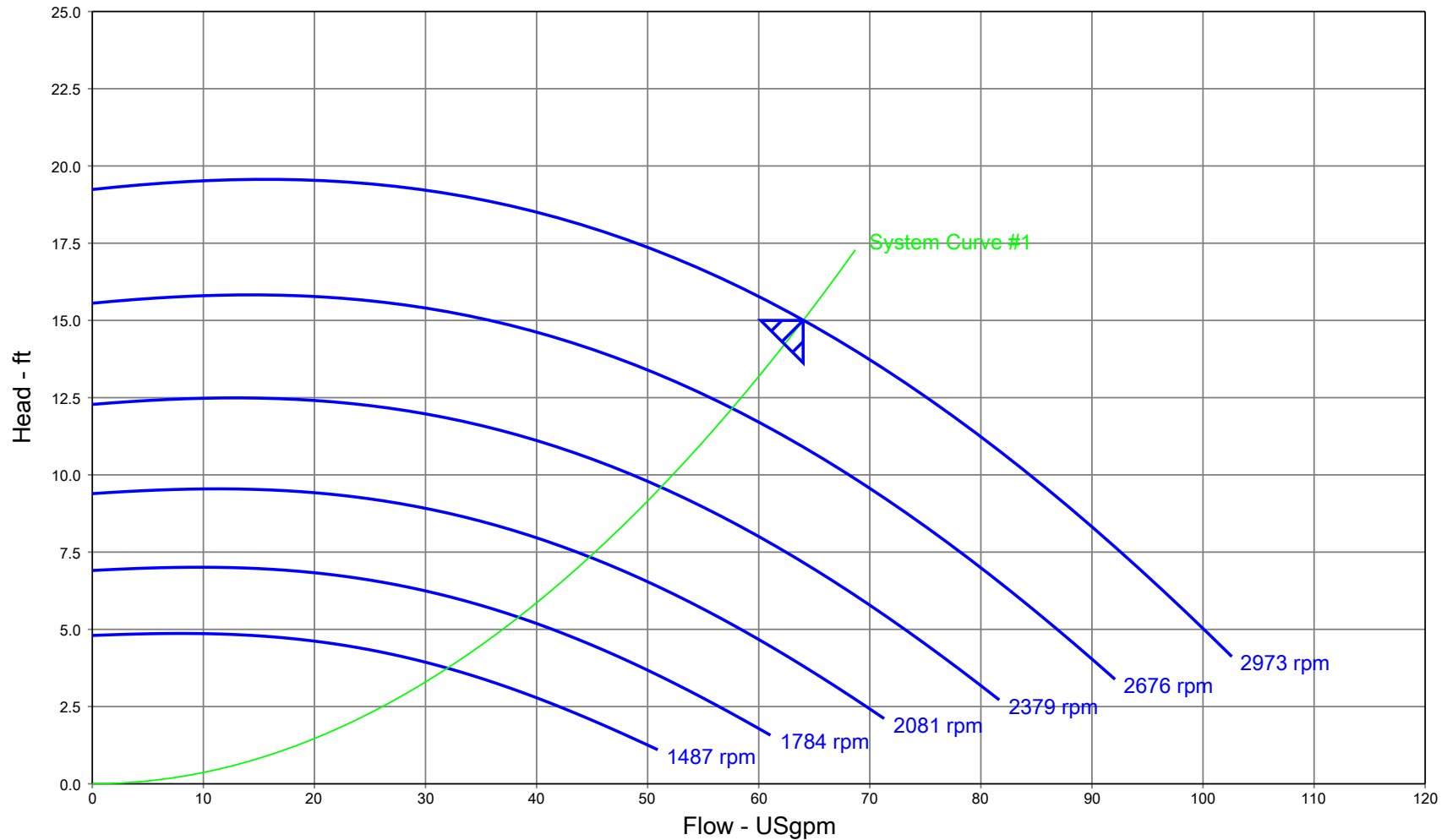




Customer :  
Reference :

# Multi-Speed Performance Curve

Wilo Quotation System 22.4.0



Item number	: ELX-1000 30TD ECM	Size	: Stratos-MAXO 2x3-25	Flow, rated	: 64.00 USgpm
Service	: Primary Boiler Loop Pump		: 1~230V	Head, rated	: 15.00 ft
Quantity	: 1	Stages	: 1	Speed	: 2973 rpm
Quote number	: 929343	Efficiency	: 67.41 %	Fluid density	: 1.000 / 1.000 SG
Based on curve number	: Maxo 2x3-25	Power, rated	: 0.36 hp	Viscosity	: 1.00 cP
Date last saved	: 12 Nov 2022 9:54 AM	NPSH required	: -	Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]	: 1.00 / 1.00 / 1.00 / 1.00
		Site Supply Frequency	: 60 Hz		
		Nominal speed	: 3800 rpm		

# Limited Warranty

All Stratos MAXO / Stratos MAXO-D / Stratos MAXO-Z circulator pumps manufactured by WILO SE are warranted to the original use only to be free of defects in materials and workmanship for a period of 48 months from the date of manufacture or 36 months from the date of installation whichever expires first. WILO's liability under this warranty shall be limited to repairing or replacing at WILO's option, without charge, F. O. B. the closest WILO distributor or service depot, any Stratos MAXO / Stratos MAXO-D / Stratos MAXO-Z pump.

WILO's liability will be limited to the replacement or repair of the product. WILO will not be liable for any costs of removal, installation or transportation or any other charges which may arise in connection with a warranty claim. Limitation of liability may not be allowed in some regions please contact local representative for interpretation.

WILO warrants that its products are free from defects in manufacture. WILO will not be liable for damage or wear to products caused by miss application of product, improperly maintained systems, accident, abuse, misuse, unauthorised alteration or repair, or if the product was not installed in accordance with WILO's published installation and operation instructions. Please visit [www.wilo.com/us/en\\_us/](http://www.wilo.com/us/en_us/) for a copy of our installation and operation instructions.

All claims under this warranty must be returned to an authorized WILO distributor for processing along with proof of purchase. Installation date and replacement date. WILO authorized distributor will then contact WILO for final product evaluation and processing.

WILO will not be liable for any damages that may arise through product failure. There are no express or implied warranties beyond those warranties described or referred to above. Limitation of liability may not be allowed in some regions please contact local representative for interpretation.

The logo for WILO, consisting of the word "wilo" in a bold, lowercase, sans-serif font. The letter "i" has a dot above it.





## Wilo-Stratos MAXO/-D/-Z

High Efficiency Commercial Circulators

### Engineering Specification

**PART 1 – GENERAL**

1.01 SECTION INCLUDES

- A. Variable speed, high efficiency, electronically commutated motor-driven, wet rotor circulator pump shall be a Wilo-Stratos MAXO/-D/-Z as manufactured by Wilo USA.
- B. Furnish and install a variable speed, high efficiency, electronically commutated motor-driven, wet rotor circulator pump with a capacity as indicated in the plans.

1.02 RELATED SECTIONS

- A. 23 21 23.19 – Vertical-Mounted, Double-Suction Centrifugal Hydronic Pumps.
- B. 22 11 23.23 – Close-Coupled, Inline, Sealless Centrifugal Domestic-Water Pumps.

1.03 REFERENCES

- A. NSF – NSF International.
- B. HI – Hydraulic Institute.
- C. UL – Underwriters Laboratories.
- D. cUL – Canadian Underwriters Laboratories.
- E. NEC – National Electrical Code.
- F. ANSI – American National Standards Institute.
- G. ECM – Electronically Commutated Motor.
- H. HMI – Human Machine Interface.

1.04 SUBMITTALS

- A. Submittal data sheet(s).
- B. Dimensional print(s).
- C. Wiring diagram(s).
- D. Installation, operation, and maintenance manual.

1.05 QUALITY ASSURANCE

- A. The complete Hydronic pump shall be NSF 61 Annex G and NSF 372 listed for drinking water and low lead requirements (-Z Models only).
- B. Liquid temperature range for the variable speed, high efficiency, electronically commutated motor-driven, wet rotor circulator pump shall be rated for 14°F to 230°F; with a minimum of 32°F for domestic water.
- C. Ambient temperature range for the variable speed, high efficiency, electronically commutated motor-driven, wet rotor circulator pump shall be rated for +14°F to 104°F.
- D. Stratos MAXO/-D/-Z pressure rating shall be 145 PSI.
- E. The wet rotor pump manufacturer shall have minimum 10 years of experience in the country of the installation.

- F. Shall be compliant to the UL Standard for Adjustable Speed Electrical Power Drive Systems – Part 5–1: Safety Requirements – Electrical, Thermal and Energy; UL61800–5–1.
- G. Shall be compliant to UL 50 and UL 50E standards for enclosures for electrical equipment.
- H. Shall be compliant to CAN/CSA C22.2 No. 274.
- I. The pump shall be labeled on the nameplate as having an Energy Efficiency Index (EEI) of no greater than 0.20.

#### 1.06 WARRANTY

- A. Provide manufacturer’s standard warranty against defects in materials and workmanship.
  - 1. Warranty Period: Wilo–Stratos MAXO/–D/–Z shall be free of defects in materials and workmanship for a period of four (4 years from date of manufacture or three (3 years from the date of installation; whichever expires first . Warranty shall cover pump, motor and terminal box as a complete unit.

## **PART 2 – PRODUCTS**

#### 2.01 MANUFACTURERS

- A. Subject to compliance with these specifications, the following manufacturers shall be acceptable:
  - 1. Wilo–Stratos MAXO/–D/–Z as manufactured by Wilo.
  - 2. Pre–approved equal.
- B. The variable speed, high efficiency, electronically commutated motor–driven, wet rotor circulator pump shall be a standard product of a single pump manufacturer. The entire pump system including pump, motor and pump HMI, shall be designed, built and tested by the same manufacturer.
- C. The variable speed, high efficiency, electronically commutated motor–driven, wet rotor circulator pump manufacturer shall have a minimum of 10 years of experience in the country of the installation.

#### 2.02 COMPONENTS

- A. PUMP(S)
  - 1. Shall be of variable speed, high efficiency, electronically commutated motor–driven, wet–rotor circulator pump design.
  - 2. Shall be NSF 61 Annex G /NSF–372 listed for drinking water and low lead requirements (–Z Models Only
  - 3. Pump Housing:
    - a. Stratos MAXO and Stratos MAXO –D pump housings shall be constructed of EN–GJL–250 Grey Cast Iron and surface–treated with Cataphoretic coating. Stratos MAXO–Z pump housings shall be constructed of Austenitic Stainless Steel 1.4408.
  - 4. Impeller(s) shall be constructed of glass fiber reinforced PPS–GF40.
  - 5. Shaft:
    - a. Stratos MAXO shall have a shaft constructed of X39CrMo17–1 Martensitic stainless steel.
    - b. Stratos MAXO–D shall have shafts constructed of X30Cr13 Martensitic stainless steel.
    - c. Stratos MAXO–Z shall have a shaft constructed of 1.4122 Chromium martensitic stainless steel with molybdenum.
  - 6. Bearing:
    - a. Stratos MAXO and Stratos MAXO –D bearings shall be constructed of Carbon–Graphite. Stratos MAXO–Z bearings shall be constructed of Antimony–Impregnated Carbon.

## B. MOTOR/ELECTRONICS

1. Shall be an Electronically Commutated Motor.
2. Voltage and Hz:
  - a. Stratos MAXO and Stratos MAXO-Z shall be compatible to supply voltage in 115v~1±10%, 50/60 Hz or 230v -240v~1±10%, 50/60 Hz.
  - b. Stratos MAXO- D shall compatible to supply voltage 230v -240v~1±10%, 50/60 Hz.
3. Shall have a protection class of Enclosure 2 with Class F insulation.

## C. HMI

1. Shall have a 4.3" LED color screen.
2. Shall allow for easy menu navigation using "GREEN BUTTON" technology.
3. Shall have the following, selectable, control modes:
  - a. Permanent, automatic performance adaptation to system requirements without set point specification; Wilo Dynamic Adapt plus with up to 20% energy savings compared to dp-v control mode.
  - b. Constant temperature (T-const., factory setting .
  - c. Constant differential temperature (dT-const. .
  - d. Needs-based volume flow optimization of the feeder pump through connectivity and communication between multiple pumps (Multi-Flow Adaptation.
  - e. Constant volume flow (Q-const. .
  - f. Differential pressure control (dp-c to a remote point in the pipe network (index circuit evaluator .
  - g. Constant differential pressure (dp-c .
  - h. Variable differential pressure (dp-v with the option to set the nominal duty point .
  - i. Constant speed (n-const. .
  - j. User-defined PID control.
4. Shall have the following display characteristics:
  - a. Control mode.
  - b. Setpoint.
  - c. US gallons per minute.
  - d. Power consumption.
  - e. Active influences (e.g. STOP, No-flow Stop .
  - f. Fault; yellow screen – pump still runs.
  - g. Failure; red screen – pump stop.
5. Shall have the following I/O:
  - a. Two configurable analogue inputs: 0–10 V, 2–10 V, 0–20 mA, 4–20 mA and commercially available PT1000; +24 V DC power supply.
  - b. Two configurable digital inputs (Ext. OFF, Ext. Min, Ext. Max, heating/cooling, manual override (uncoupled from building automation, operation lock (key lock and remote operation configuration protection.
  - c. Two configurable signal relays for operational and fault messages.
  - d. Slot for Wilo-CIF modules with interfaces for building automation BA (optional accessories: CIF modules Modbus RTU, BACnet MS/TP .
  - e. Wilo Net as a Wilo system bus for communication between Wilo products, e.g. Multi-Flow Adaptation; double pump operation and Wilo-Smart Gateway.
  - f. Integrated temperature sensor.



- g. Automatic emergency operation with definable pump speed for exceptional circumstances, e.g. bus communication or sensor value malfunction.
- h. Use the Wilo-Assistant app to read and set operating data and –among other things– set up a commissioning protocol through the Bluetooth interface (no further accessories required).
- i. Cable break detection when using an analogue signal (in connection with 2–10 V or 4–20 mA).
- j. Pre-set date and time.

#### D. FUNCTIONS

1. Heat quantity measurement.
2. Cooling quantity measurement.
3. Pump automatically deactivates when no flow is detected (No-Flow Stop).
4. Switchover between heating and cooling mode (automatic, external or manual).
5. Adjustable volume flow limiter using the Q-Limit function (Qmin. and Qmax.).
6. Operating modes of twin-head pumps: Efficiency-optimized parallel operation for dp-c and dp-v, main and standby operation.
7. Ability to save and restore configured pump settings of up to three restoration points.
8. Fault and warning messages shown in plain text with advice on resolving the issue.
9. Pump venting function for automatic venting of the rotor chamber.
10. Automatic setback operation.
11. Automatic deblocking function and integrated full motor protection.
12. Dry-running detection.
13. Automatic detection of thermal disinfection for domestic hot water circulation in conjunction with a separate temperature sensor (Stratos MAXO-Z Only).

#### E. EXTERNAL ACCESSORIES

1. CIF Modules:
  - a. BACnet MS/TP.
  - b. Modbus RTU.
  - c. LonWorks.
  - d. CanBUS.
2. PT 1000 (B pipe contact sensor (for domestic hot water).
3. PT 1000 (AA sensor for installation in immersion well).
4. Differential pressure sensor.

## **PART 3 – EXECUTION**

### 3.01 INSTALLATION

#### A. Scope of delivery

- a. Complete pump and motor assembly.
- b. Stratos MAXO and Stratos MAXO-Z shall have an optimized Wilo-Connector with ½” NPT connection adaptor. Stratos MAXO-D shall have 2x optimized Wilo-Connector with ½” NPT connection adaptor.
- c. Stratos MAXO and Stratos MAXO-Z shall have 5x threaded cable glands M16 x 1.5. Stratos MAXO-D shall have 10x threaded cable glands M16 x 1.5.
- d. Stratos MAXO and Stratos MAXO-Z shall have gaskets for 1.25, 1.5 and 2 inch flange connections.

- e. Concise Installation and operating instructions.
- B. Install equipment in accordance with manufacturer's instructions.
- C. Power wiring, as required, shall be the responsibility of the electrical contractor. All wiring shall be performed per manufacturer's instructions and applicable state, federal and local codes.
- D. All factory wiring shall be numbered for easy identification and the numbers shall coincide with those shown on the wiring diagram.
- E. Unit shall be a Wilo-Stratos MAXO as manufactured by Wilo USA.

END OF SECTION

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**Elite XL Commercial Boiler Specification Sheet**  
**Model: ELX-400FBN / 500 / 650 / 800 / 1000 / 2000**

The boiler shall be an HTP, Inc. model **ELX-1000FBN**, having a modulation input range of **100,000 - 1,000,000** Btu/Hr, and shall operate on Natural Gas (NG). The boiler shall be capable of full modulation with a turndown ratio of up to 10:1.

The boiler heat exchanger shall be certified and stamped for 160PSI, and shall be National Board Listed. There shall be no banding material, bolts, gaskets, or “O” rings in the header configuration. The heat exchanger is removable from the cabinet for replacement without removing the entire boiler assembly from the site. The stainless steel combustion chamber shall be designed to direct condensate to the rear of the chamber to ensure that condensation does not collect in the boiler. The complete heat exchanger assembly shall have a ten (10) year limited warranty.

The boiler shall be certified and listed by ETL under the latest edition of the harmonized ANSI Z21.13 test standard for the US and Canada. The boiler shall comply with the energy efficiency requirements of the latest edition of the ASHRAE 90.1 Standard and the minimum efficiency requirements of the latest edition of the ASHRAE 103 Standard. The boiler shall operate at up to **97%** thermal efficiency. The boiler shall be certified for indoor/outdoor installation.

The boiler shall be constructed with a heavy gauge steel jacket assembly, primed and pre-painted on both sides. The boiler jacket shall afford easy access to all components through easily removable access doors to facilitate service of all components. The combustion chamber shall be sealed and completely enclosed, independent of the outer jacket assembly, so that integrity of the outer jacket does not affect a proper seal. A burner/flame observation port shall be provided. The burner shall be a premix design and constructed of **high grade stainless steel** with modulating firing rates. The boiler shall be supplied with a gas valve designed with a negative pressure regulation gas valve (400 – 1000 Models), or an electronic gas valve (2000 Models), and be equipped with a variable speed blower system to precisely control the fuel/air mixture to provide modulating boiler firing rates for maximum efficiency. The boiler shall operate in a safe condition at a derated output with gas supply pressures as low as 3 ½ inches of water column.

The control customer connection board shall be equipped with two screw type terminal strips. One of the terminal strips is designated for low voltage connection inputs including thermostat, DHW sensor, system sensor, outdoor sensor, 0-10VDC, external low water cut off input signals. There are also two sets of Low Voltage Output 0-10 volt - A (Modulating Pump Output) and Low Voltage B (see the status of various parameters through 0-10VDC output for the Fan Speed - Boiler Power - Cascade Power Alarm Status or Target temperature). The other terminal strip is designated for 120-volt connections for incoming power, central heat pump (CH), DHW pump (indirect water heater), and system pump operation with additional double pole relay rated at 5 amp for Alarm Output. All three pump outputs are 2-amp fuse protected. The control cabinet will also include two RJ-45 style jacks for cascade communication bus wiring using CAT 5. All of these connections and fuses are accessed from the outside of the boiler by removing an access door. The electrical supply shall be 120 volt / 60 hertz / single phase on all models. Two additional electrical connections are provided internal to the boiler cabinet for the connection of optional high and low gas pressure switches. The boiler comes equipped with a certified UL 353 low water cut off (LWCO) safety with manual reset. An outdoor sensor is supplied with the boiler.

The boiler shall utilize a 120 VAC control circuit and components. The control system shall have a seven-inch (7”) color touch screen display for boiler setup, status, and diagnostics. All components shall be easily accessed and serviceable from the front, right, and left sides of the jacket. The boiler shall be supplied with a temperature/pressure gauge, ASME certified pressure relief valve, outlet water temperature sensor, return water temperature sensor, blocked vent pressure switch, flue temperature sensor, built-in freeze protection, and an optional high limit temperature control with manual reset. The boiler shall also be equipped with an outdoor temperature reset function.

The boiler features the HTP Link system as standard equipment. HTP Link offers a WiFi connection, allowing the user to remotely monitor boiler operation, change system parameters to maximize boiler efficiency, and alerting the user when system issues occur to aid in troubleshooting. The boiler shall include an ON/OFF power switch and feature the 928 intelligent control system with color touch screen display with graphic indicators for System Pump, DHW Pump, Boiler Pump, Pump Service Mode, Flame On, and Fault Indication. Pump operation and the combustion system can be manually operated to assist the installer in system commissioning. The control will have password protection for the installer to set limits and configure outdoor reset. The control will have freeze protection (which can be disabled for snowmelt applications), outdoor reset, indirect priority with operation time limits, and a 0-10V DC input for building management system (i.e. programmable to control either boiler temperature or firing). The boiler control **shall include** the optional gateway device which will allow integration of Modbus or

BACnet Protocols. The boiler control is equipped for cascading up to eight boilers for greater system turndown and system backup.

The boiler shall be equipped with a condensate collection system equipped with an internal float switch which will protect the boiler from condensation backing up into the combustion chamber. The condensate collection system will be equipped with a 2" NPT threaded cleanout port to allow for easy cleaning and sediment removal. An appropriately sized condensate neutralizer shall be provided with the boiler.

The boiler will have a sealed combustion system, taking outside air for combustion and exhausting the flue gas with a stainless steel adapter for 4" Category IV Stainless Steel, PVC, CPVC, or Polypropylene (400 / 500 models), 6" Category IV Stainless Steel, PVC CPVC, or Polypropylene (650, 800 and 1000 models), or 8" Category IV Stainless Steel, PVC CPVC, or Polypropylene (2000 models). The boiler's total combined equivalent vent length, including fitting allowances for both intake and exhaust, shall not exceed 125 feet (400 – 1000 Models), or 150 feet (2000 Models).

The boiler can be vented in many methods, including:

**Horizontal Venting** shall be done as a balanced system only. Both intake and exhaust must terminate on the same side of the building.

**Vertical Venting** shall be done either as a balanced or unbalanced system. An unbalanced system shall ONLY be allowed when the exhaust is installed vertically and the intake horizontally. Both exhaust and intake must remain within the boiler's combined equivalent length.

~~**Indoor Combustion Venting from a Confined or Unconfined Space**—Where the exhaust runs vertically and combustion air is drawn either from the mechanical room or from outdoors.~~

Adequate combustion air must be supplied when drawing air from the mechanical room. Avoid the room contaminants listed in the installation manual. (Refer to appliance installation manual venting section for additional venting requirements.)

**CAUTION: Foam core pipe is NOT an approved material for either intake or exhaust piping.**

The boiler shall be in compliance with the NOx emissions limit set forth in SCAQMD Rule 1146.2. The manufacturer shall verify proper operation of the burner, the combustion and control systems, as well as all related safety functions, to ensure the boiler will operate based on its designed parameters before shipping. Complete operating and installation instructions shall be furnished with every boiler as packaged by the manufacturer for shipping.

The appliance shall operate at high elevations without additional parts. However, adjustments to the combustion system may be required at any elevation. See installation manual for combustion system setting details.

Maximum unit dimensions shall be length        inches, width        inches and height        inches. Maximum unit weight shall be pounds.

**NOTE: Due to variations in CSD-1 requirements from state to state, please consult with the factory for all controls required in your jurisdiction.**

**NOTE: HTP reserves the right to make product changes or updates without notice and will not be held liable for typographical errors in literature.**