Phantom-X 399C/500C/600C/700C/800C

Residential High Efficiency
Gas Boilers

PHNTM399C, 500C, 600C, 700C, 800C Submittal Sheet

PHNTM Floor Standing Heating Boilers

Wholesaler _____

Job Name _____

Mechanical Contractor _____

Model Number _____ Quantity: _____

Gas Type _____

BTU/hr INPUT _____

BTU/hr OUTPUT _____

Venting Application _____

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Standard Features

- ASME Constructed Stainless Steel Water Tube Heat Exchanger
- 50 psi Relief Valve
- 210F Maximum Operating Supply Temperature
- Thermal Efficiency up to 97.0%
- Fully Modulating Burner System with 5:1 Turndown Ratio
- Vent Adapter Allows For 4" CPVC/PVC or Single Wall Polypropylene or Stainless Venting
  Note: See Installation Manual for a List of Approved Vent Systems, Vent Length Limitations, and Other Installation Requirements
- Polypropylene Condensate Trap
- Boiler, System and Domestic Hot Water Pump Output Terminals
- Tight Clearances to Combustible Material
- Field Convertible to LP Gas
- Stackable for Floor Space Savings
- Microprocessor Based Honeywell Sola Control System with Touch Screen User Interface Consisting of:
  - o Direct Spark Ignition System
  - o Supply, Return, Flue, Outdoor Sensors and Flow Switch
  - o Lead/Lag and Selectable DHW Priority
  - o Warm Weather Shutdown
  - o Pump Exercise
  - o Central Heating System Freeze Protection
  - o Energy Management System (EMS) 4-20mA Interface
  - o Plug & Play Multiple Boiler Peer-Peer Communication Network Connections For Up to 8 Multiple Boiler Installations
  - o Remote Firing Rate and External Limit Terminal Contacts
  - o Terminal Contacts for Optional Header Sensor
- 9 Year Limited Heat Exchanger Warranty, 1 Year Warranty On Parts

Optional Equipment

- Sage Zone Panel
- Condensate Neutralizer
- Header Sensor Kit - Required for multiple boiler systems
- RJ45 Cable Splitter
- LWCO Kit
- Manual Reset High Limit
- CSD-1 kit for 399C includes manual reset high limit and immersion well.
- CSD-1 kit for 500C thru 800C includes high and low gas pressure switches (manual reset).

Special Job Notes:

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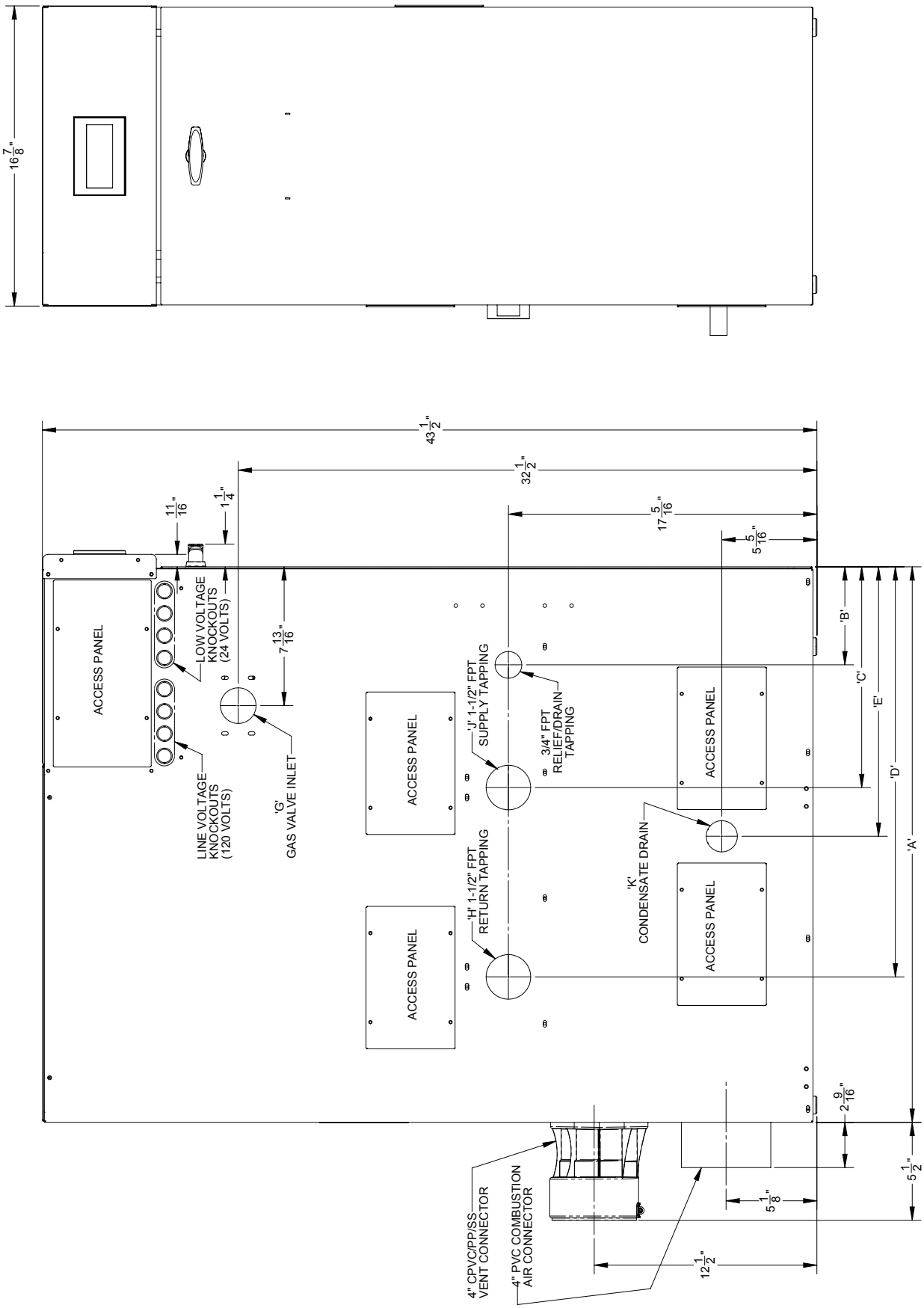
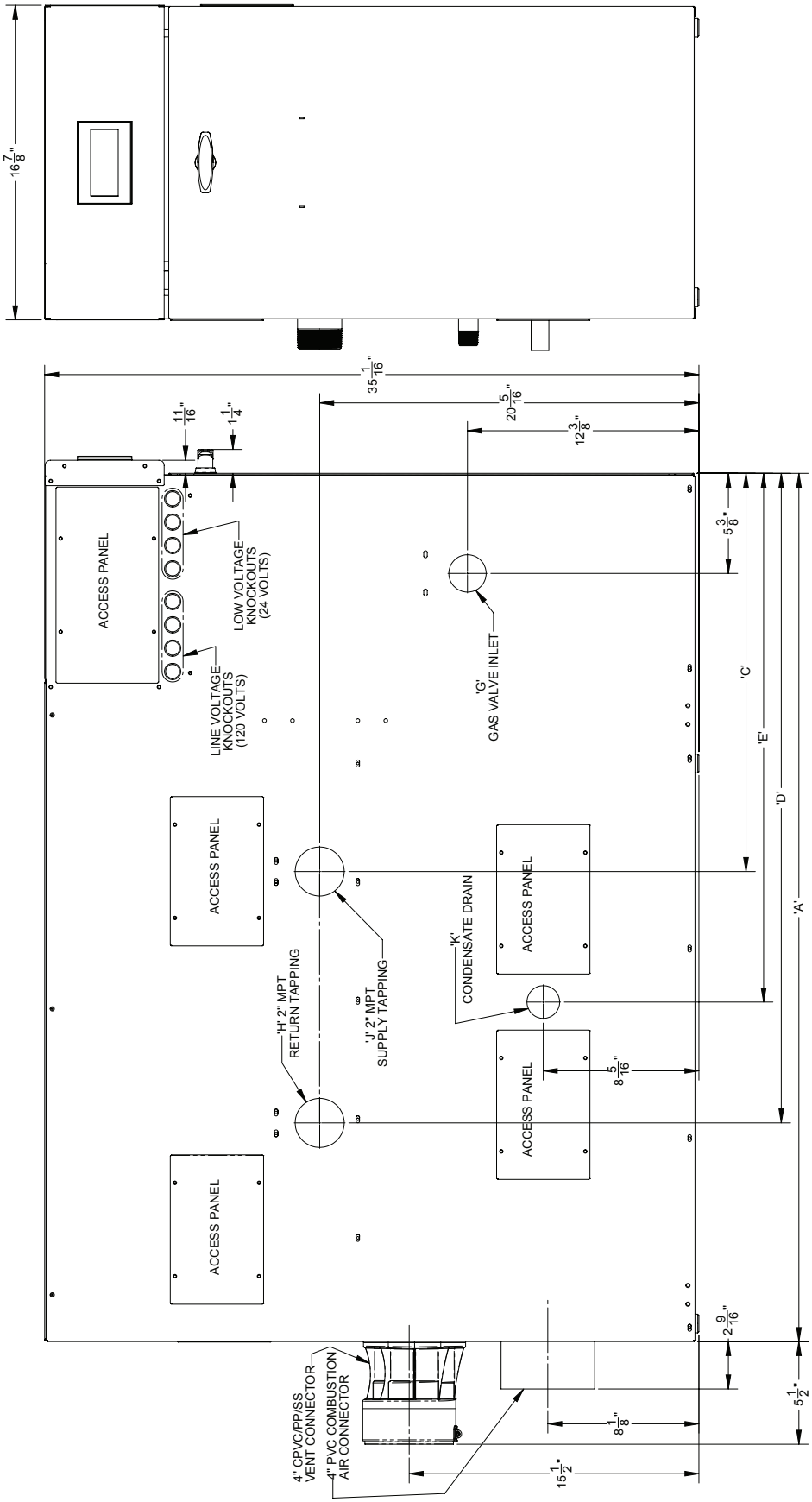
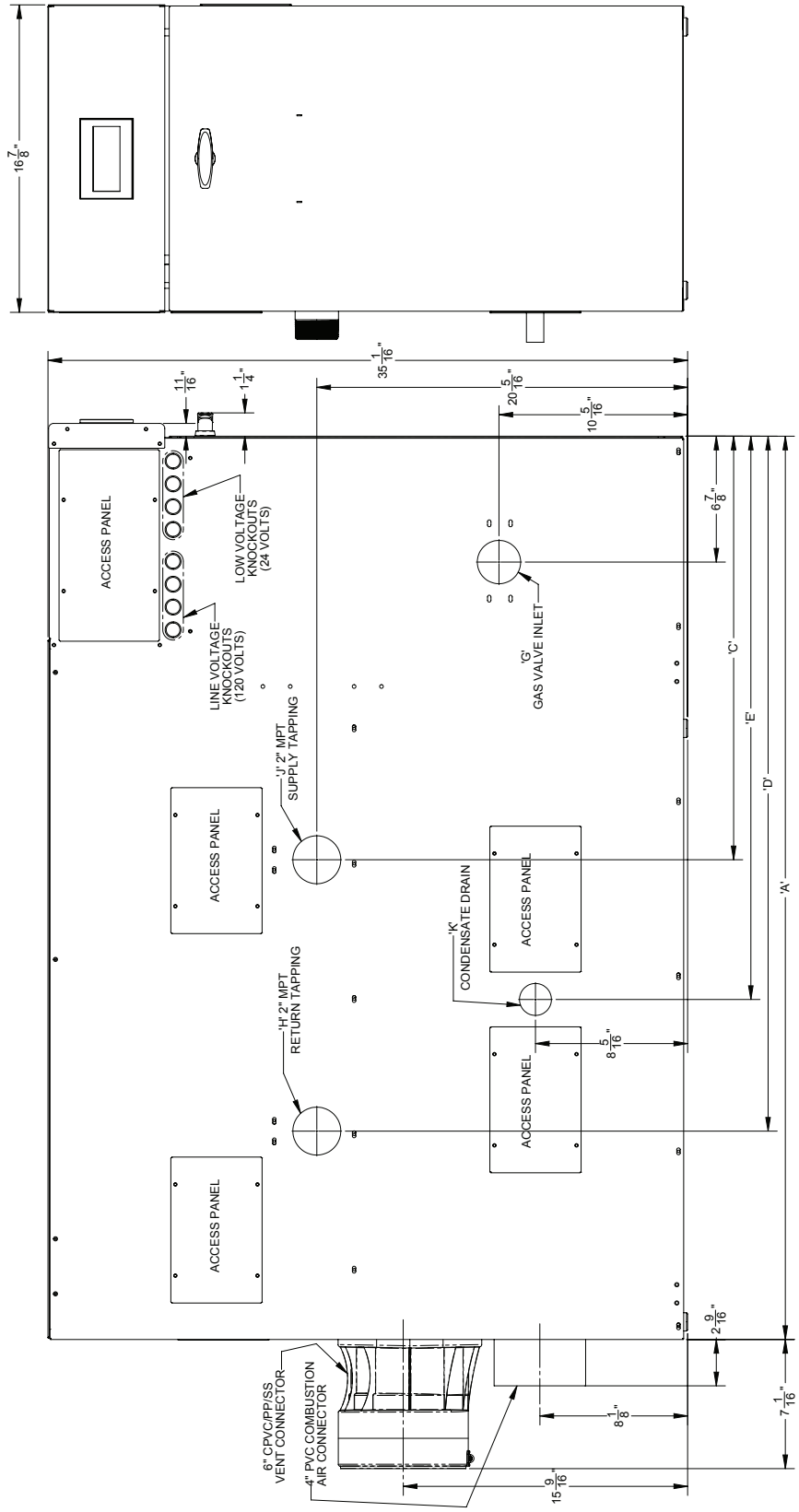

16 7/8"
43 1/2"
32 1/2"
17 5/16"
5 5/16"
11/16"
1 1/4"
7 13/16"
ACCESS PANEL
LOW VOLTAGE KNOCKOUTS (24 VOLTS)
LINE VOLTAGE KNOCKOUTS (120 VOLTS)
'G' GAS VALVE INLET
'J' 1-1/2" FPT SUPPLY TAPPING
3/4" FPT RELIEF/DRAIN TAPPING
'H' 1-1/2" FPT RETURN TAPPING
'K' CONDENSATE DRAIN
'B'
'C'
'E'
'D'
'A'
2 9/16"
5 1/2"
5 1/8"
12 1/2"
4" CPVC/PP/SS VENT CONNECTOR
4" PVC COMBUSTION AIR CONNECTOR


16 7/8"
35 1/16"
20 5/16"
12 3/8"
11/16"
1 1/4"
ACCESS PANEL
LOW VOLTAGE KNOCKOUTS (24 VOLTS)
LINE VOLTAGE KNOCKOUTS (120 VOLTS)
'G' GAS VALVE INLET
5 3/8"
'C'
'E'
'D'
'A'
ACCESS PANEL
ACCESS PANEL
'K' CONDENSATE DRAIN
'H' 2" MPT RETURN TAPPING
'J' 2" MPT SUPPLY TAPPING
8 5/16"
ACCESS PANEL
ACCESS PANEL
2 9/16"
5 1/2"
8 1/8"
15 1/2"
4" CPVC/PP/SS VENT CONNECTOR
4" PVC COMBUSTION AIR CONNECTOR


16 7/8"
35 1/16"
11/16"
1 1/4"
20 5/16"
10 5/16"
ACCESS PANEL
LOW VOLTAGE KNOCKOUTS (24 VOLTS)
LINE VOLTAGE KNOCKOUTS (120 VOLTS)
'G' GAS VALVE INLET
6 7/8"
'C'
'E'
'D'
'A'
'J' 2" MPT SUPPLY TAPPING
'K' CONDENSATE DRAIN
'H' 2" MPT RETURN TAPPING
8 5/16"
2 9/16"
7 1/16"
8 1/8"
15 9/16"
6" CPVC/PP/SS VENT CONNECTOR
4" PVC COMBUSTION AIR CONNECTOR

Ratings for Phantom X Series Gas-Fired Boilers						
Model Number	**Input (MBH)**		**Gross Output (MBH)**	**Net Ratings Water [1] (MBH)**	**Thermal Efficiency (%)**	**Combustion Efficiency (%)**
	Min.	**Max.**				
PHNTM399C	80	399	375	326	94.1	94.5
PHNTM500C	100	500	485	422	97.0	96.0
PHNTM600C	125	625	594	517	95.0	96.0
PHNTM700C	145	725	689	599	95.0	95.0
PHNTM800C	160	800	760	661	95.0	94.0
Ratings shown are for installations at sea level and elevations up to 2000 ft. at minimum vent length. For elevations above 2000 ft., see Appendix A Instructions in manual for High Altitude Installations above 2000 ft.						
[1] Net AHRI Water Ratings based on allowance of 1.15. Consult manufacturer before selecting boiler for installations having unusual piping and pickup requirements, such as intermittent system operation, extensive piping systems, etc.						

Specification	Boiler Model				
	PHNTM399C	PHNTM500C	PHNTM600C	PHNTM700C	PHNTM800C
Altitude (ft. above sea level) [1]	0-10,100	[2] 0-10,100	0-10,100	0-10,100[3]	0-6,000[4]
Fuel	Shipped for Natural Gas, Field Converted for LP Gas		Shipped for Natural Gas or Shipped for LP Gas (no Field Conversion)		
Max. Allowable Water Temperature (°F)	210	210	210	210	210
Max. Allowable Working Pressure (psi)	160	160	160	160	160
Factory Supplied Safety Relief Valve (psi)*	50	50	60	60	60
Boiler Water Volume (gal.)	3.4	4.3	5.4	5.4	6.2
Heat Transfer Area (sq. ft.)	41.8	58.1	76.2	76.2	87.0
Approx. Shipping Weight (lb.)	316	368	458	458	500

[1]Follow Instructions for High Altitude Installations above 2000 ft
[2]PHNTM500C LP cannot be installed above 6,000 ft
[3]PHNTM700C LP cannot be installed above 7,800 ft
[4]PHNTM800C natural gas cannot be installed above 6,000 ft. PHNTM800C LP can be installed up to 10,100 ft

Dimension	Boiler Model				
	PHNTM399C	PHNTM500C	PHNTM600C	PHNTM700C	PHNTM800C
A - Inch (mm)	31-3/16 (792)	46-1/2 (1181)	49-1/2 (1258)	49-1/2 (1258)	53-5/16 (1354)
B - Inch (mm)	5-1/2 (140)	N/A	N/A	N/A	N/A
C - Inch (mm)	12-3/8 (314)	21-5/16 (541)	23-1/4 (591)	23-1/4 (591)	23-7/16 (596)
D - Inch (mm)	23 (584)	34-13/16 (884)	38-1/16 (967)	38-1/16 (967)	41-3/16 (1046)
E - Inch (mm)	15-1/8 (384)	28-5/16 (719)	30-7/8 (784)	30-7/8 (784)	32-9/16 (827)
Gas Inlet G - Inch	(FPT) 3/4		(FPT) 1		
Return H - Inch	FPT 1-1/2	MPT 2			
Supply J - Inch	FPT 1-1/2	MPT 2			
PP Condensate Drain K - Inch	PVC Compression Coupling 3/4				
PVC Combustion Air Connector - Inch	4				
CPVC/PP/SS Vent Connector - Inch ((mm	4 (100)		(150) 6		

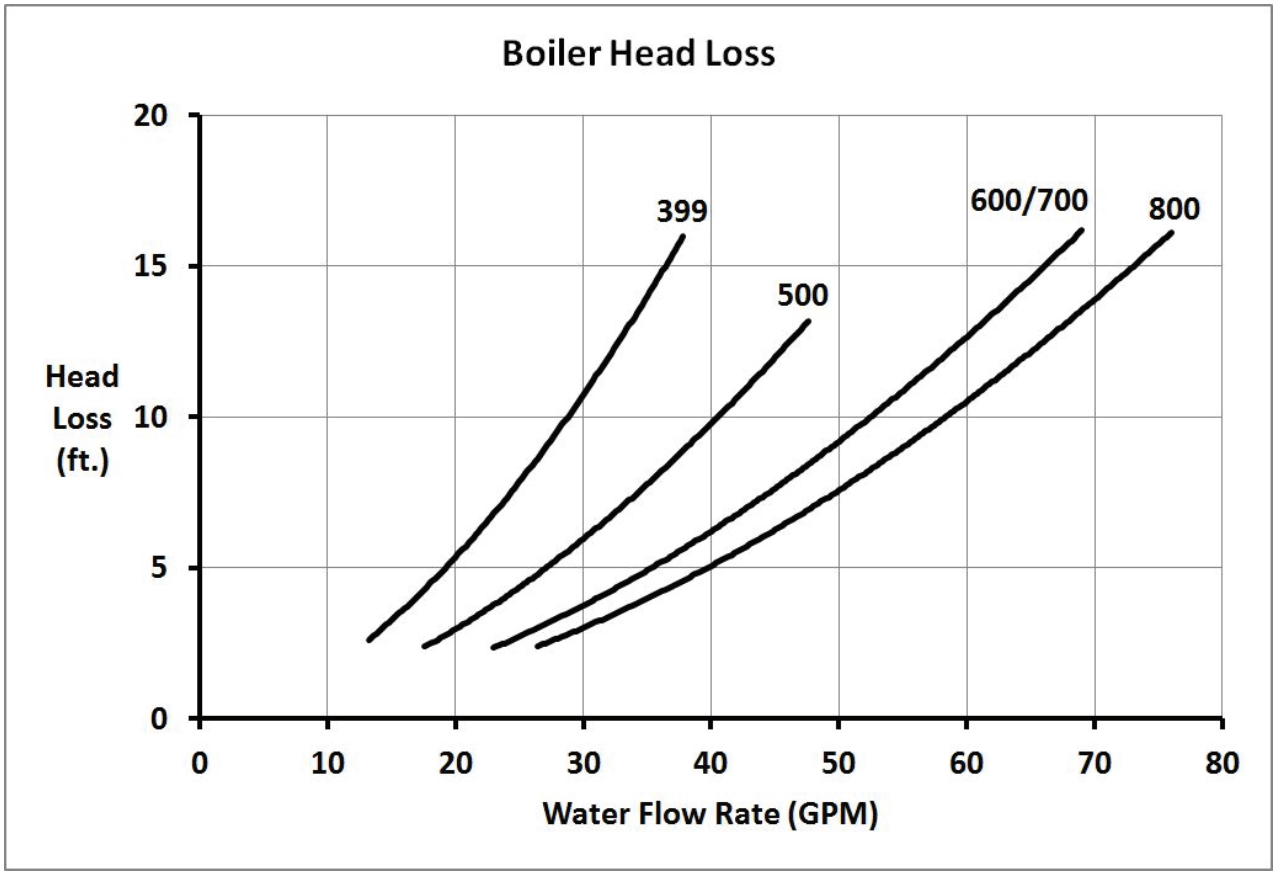
Venting Note: Sizes noted are for two pipe CPVC/PVC & certain specified two pipe polypropylene and certain specified stainless steel vent systems. Concentric vent terminals are not permitted. See installation manual for venting option details.

Flow Range Requirement Through Boiler

Boiler Model	Supply Connection (in.)	Return Connection (in.)	ΔT= 35°F		ΔT = 30°F		ΔT = 25°F		ΔT = 20°F	
			Minimum Required Flow (GPM)	Boiler Head Loss (ft.)	Required Flow (GPM)	Boiler Head Loss (ft.)	Required Flow (GPM)	Boiler Head Loss (ft.)	Maximum Required Flow (GPM)	Boiler Head Loss (ft.)
PHNTM399C	1-1/2	1-1/2	21.5	6.1	25.1	7.9	30.2	10.8	37.7	15.9
PHNTM500C	2	2	27.7	5.2	32.3	6.8	38.8	9.3	48.5	13.6
PHNTM600C	2	2	33.9	4.7	39.6	6.1	47.5	8.4	59.4	12.4
PHNTM700C	2	2	39.4	6.0	45.9	7.9	55.1	10.9	68.9	16.1
PHNTM800C	2	2	43.4	5.9	50.7	7.8	60.8	10.8	76.0	16.1

Notes: Required Flow = Output*1000/(500*ΔT), where flow rate is in GPM, output is in MBH, and ΔT is in °F

Outputs for specific boiler models are provided in Ratings Table on page 5. See also tables on page 7 for near boiler piping sizing. Using boiler antifreeze will result in increased fluid density and may require larger circulators.



Recommended Taco Circulators for 50 ft. Equivalent ft. Near Boiler Piping [Approximately 20 ft. Straight Pipe, (4) 90° Elbows, and (2) Full Port Ball Valves]

Boiler Model	Supply & Return Connection (in.)	Near Boiler Pipe Size (in.)	ΔT=35°F			ΔT=30°F			ΔT=25°F			ΔT=20°F		
			Flow (GPM)	Boiler & Piping Head Loss (ft.)	Circulator Model	Flow (GPM)	Boiler & Piping Head Loss (ft.)	Circulator Model	Flow (GPM)	Boiler & Piping Head Loss (ft.)	Circulator Model	Flow (GPM)	Boiler & Piping Head Loss (ft.)	Circulator Model
PHNTM399C	1½	2	21.4	6.4	0014	25.0	8.3	0013	30.0	11.4	2400-60	37.5	16.8	2400-70
PHNTM500C	2	2	27.7	5.8	0012	32.3	7.5	2400-60	38.8	10.3	2400-60	48.5	15.2	2400-65
PHNTM600C	2	2	33.9	5.5	2400-60	39.6	7.2	2400-60	47.5	9.9	2400-65	59.4	14.7	2400-70
PHNTM700C	2	2	39.4	7.1	2400-60	45.9	9.4	2400-65	55.1	12.9	2400-65	68.9	19.1	1935
PHNTM800C	2	2 1/2	43.4	6.4	2400-60	50.7	8.5	2400-65	60.8	11.8	2400-65	76.0	17.6	1935

Recommended Grundfos Circulators for 50 Equivalent ft. Near Boiler Piping [Approximately 20 ft. Straight Pipe, (4) 90° Elbows, and (2) Full Port Ball Valves]

Boiler Model	Supply & Return Connection (in.)	Near Boiler Pipe Size (in.)	ΔT=35°F			ΔT=30°F			ΔT=25°F			ΔT=20°F		
			Flow (GPM)	Boiler & Piping Head Loss (ft.)	Circulator Model	Flow (GPM)	Boiler & Piping Head Loss (ft.)	Circulator Model	Flow (GPM)	Boiler & Piping Head Loss (ft.)	Circulator Model	Flow (GPM)	Boiler & Piping Head Loss (ft.)	Circulator Model
PHNTM399C	1½	2	21.5	6.4	UP26-64F	25.1	8.4	UP26-99F	30.2	11.5	UPS43-100F, Spd. 2	37.7	16.9	UPS43-100F, Spd. 3
PHNTM500C	2	2	27.7	5.8	UPS43-44FC, Spd. 2	32.3	7.5	UPS43-44F	38.8	10.3	UPS43-100F, Spd. 2	48.5	15.2	UP50-60F, Spd. 3
PHNTM600C	2	2	33.9	5.5	UPS43-44FC, Spd. 3	39.6	7.2	UPS43-100F, Spd. 2	47.5	9.9	UPS50-60F, Spd. 2	59.4	14.7	UPS40-80/2, Spd.3
PHNTM700C	2	2	39.4	7.1	UPS43-100F, Spd. 2	45.9	9.4	UPS43-100F, Spd. 3	55.1	12.9	UPS50-60F, Spd. 3	68.9	19.1	UP50-80/2, Spd. 3
PHNTM800C	2	2 1/2	43.4	6.4	UPS43-100F, Spd.2	50.7	8.5	UPS43-100F, Spd. 3	60.8	11.8	UP-50-60F, Spd. 3	76.0	17.6	UPS50-80/2, Spd. 3