

DISPLAY THIS CARD ON PRINCIPAL FRONTAGE OF WORK



# CITY OF PORTLAND

# BUILDING PERMIT

This is to certify that The City of Portland

Located At 44 HANOVER ST

Job ID: 2011-10-2349-HVAC

CBL: 033- B-008-001

has permission to Install Hydrotherm KN6

provided that the person or persons, firm or corporation accepting this permit shall comply with all of the provisions of the Statues of Maine and of the Ordinances of the City of Portland regulating the construction, maintenance and use of the buildings and structures, and of the application on file in the department.

Notification of inspection and written permission procured before this building or part thereof is lathed or otherwise closed-in. 48 HOUR NOTICE IS REQUIRED.

A final inspection must be completed by owner before this building or part thereof is occupied. If a certificate of occupancy is required, it must be

\_\_\_\_\_  
**Fire Prevention Officer**

\_\_\_\_\_  
**Code Enforcement Officer / Plan Reviewer**

**THIS CARD MUST BE POSTED ON THE STREET SIDE OF THE PROPERTY  
PENALTY FOR REMOVING THIS CARD**

## BUILDING PERMIT INSPECTION PROCEDURES

Please call 874-8703 or 874-8693 (ONLY)

or email: [buildinginspections@portlandmaine.gov](mailto:buildinginspections@portlandmaine.gov)

With the issuance of this permit, the owner, builder or their designee is required to provide adequate notice to the city of Portland Inspections Services for the following inspections. Appointments must be requested 48 to 72 hours in advance of the required inspection. The inspection date will need to be confirmed by this office.

- **Please read the conditions of approval that is attached to this permit!! Contact this office if you have any questions.**
- **Permits expire in 6 months. If the project is not started or ceases for 6 months.**
- **If the inspection requirements are not followed as stated below additional fees may be incurred due to the issuance of a "Stop Work Order" and subsequent release to continue.**

The project cannot move to the next phase prior to the required inspection and approval to continue, REGARDLESS OF THE NOTICE OF CIRCUMSTANCES.

IF THE PERMIT REQUIRES A CERTIFICATE OF OCCUPANCY, IT MUST BE PAID FOR AND ISSUED TO THE OWNER OR DESIGNEE BEFORE THE SPACE MAY BE OCCUPIED.



# PORTLAND MAINE

*Strengthening a Remarkable City, Building a Community for Life • [www.portlandmaine.gov](http://www.portlandmaine.gov)*

Director of Planning and Urban Development  
Penny St. Louis

Job ID: 2011-10-2349-HVAC

Located At: 44 HANOVER ST

CBL: 033- B-008-001

## **Conditions of Approval:**

### **Fire**

Installation shall comply with City Code Chapter 10.

Fuel-fired boilers shall be protected in accordance with NFPA 101, *Life Safety Code*.

Installation shall comply with NFPA 211, *Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances*;

NFPA 54, *National Fuel Gas Code*;

NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*;

NFPA 91, *Standard for Exhaust Systems for Air Conveying Vapors, Gases, Mists, and Noncombustible Particulate Solids*;

NFPA 70, *National Electrical Code*; and the manufacturer's published instructions.

**City of Portland, Maine - Building or Use Permit Application**

389 Congress Street, 04101 Tel: (207) 874-8703, FAX: (207) 8716

Job No: 2011-10-2349-HVAC	Date Applied: 10/4/2011	CBL: 033- B-008-001	
Location of Construction: 44 HANOVER ST / 55 Portland	Owner Name: City of Portland	Owner Address: 389 CONGRESS ST PORTLAND, ME 04101	Phone:
Business Name:	Contractor Name: Mechanical Services, Inc	Contractor Address: 400 Presumpscot St, Portland, ME	Phone: 774-1531
Lessee/Buyer's Name:	Phone:	Permit Type: HVAC - HVAC	Zone: B-2b
Past Use: Public Services Facilities	Proposed Use: Public Services Facilities – to install new heating system – Hydrotherm KN6	Cost of Work: \$82,000.00	CEO District:
		Fire Dept: <input type="checkbox"/> Approved w/conditions <input type="checkbox"/> Denied <input type="checkbox"/> N/A Signature: Capt. Pitone 10/10/11	Inspection: Use Group: HVAC Type: Signature:
Proposed Project Description: Hydrotherm KN6		Pedestrian Activities District (P.A.D.)	
Permit Taken By: Planning	<b>Zoning Approval</b>		

	Special Zone or Reviews	Zoning Appeal	Historic Preservation
1. This permit application does not preclude the Applicant(s) from meeting applicable State and Federal Rules. 2. Building Permits do not include plumbing, septic or electrical work. 3. Building permits are void if work is not started within six (6) months of the date of issuance. False informatin may invalidate a building permit and stop all work.	<input type="checkbox"/> Shoreland <input type="checkbox"/> Wetlands <input type="checkbox"/> Flood Zone <input type="checkbox"/> Subdivision <input type="checkbox"/> Site Plan  <input type="checkbox"/> Maj <input type="checkbox"/> Min <input type="checkbox"/> MM Date: <i>OK 10/5/11</i>	<input type="checkbox"/> Variance <input type="checkbox"/> Miscellaneous <input type="checkbox"/> Conditional Use <input type="checkbox"/> Interpretation <input type="checkbox"/> Approved <input type="checkbox"/> Denied  Date:	<input checked="" type="checkbox"/> Not in Dist or Landmark <input type="checkbox"/> Does not Require Review <input type="checkbox"/> Requires Review <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/Conditions <input type="checkbox"/> Denied  Date: <i>S</i>

**CERTIFICATION**

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the application is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provision of the code(s) applicable to such permit.

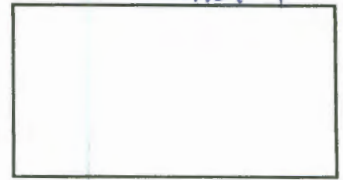
SIGNATURE OF APPLICANT	ADDRESS	DATE	PHONE
RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE	DATE	PHONE	



FILL IN AND SIGN WITH INK

Rec'd 4/20/14

# APPLICATION FOR PERMIT HEATING OR POWER EQUIPMENT



33-B-8

B-2b

To the INSPECTOR OF BUILDINGS, PORTLAND, ME.

The undersigned hereby applies for a permit to install the following heating, cooking or power equipment in accordance with the Laws of Maine, the Building Code of the City of Portland, and the following specifications:

Location / CBL called 44 Hanover St 55 Portland St Use of Building Public Works Date 9/27/11

Name and address of owner of appliance City of Portland

Installer's name and address Mechanical Services, Inc  
400 Presumpscot St. Portland Telephone 774-1531

**Location of appliance:**

Basement       Floor  
 Attic             Roof

**Type of Fuel:**

Gas       Oil       Solid

**Appliance Name:** Hydrotherm KNL6

U.L. Approved  Yes  No

Will appliance be installed in accordance with the manufacture's installation instructions?  Yes       No

IF NO Explain: \_\_\_\_\_

**Type of Chimney:**

Masonry Lined  
Factory built \_\_\_\_\_

Metal  
Factory Built U.L. Listing # 1738

Direct Vent  
Type \_\_\_\_\_ UL# \_\_\_\_\_

**Type of Fuel Tank**

Oil  
 Gas

Size of Tank N/A

Number of Tanks \_\_\_\_\_

Distance from Tank to Center of Flame \_\_\_\_\_ feet.

Cost of Work: \$ 81,740

Permit Fee: \$ N/A

**The Type of License of Installer:**

Master Plumber # \_\_\_\_\_  
 Solid Fuel # \_\_\_\_\_  
 Oil # \_\_\_\_\_  
 Gas # PNT8337  
 Other \_\_\_\_\_

**Approved**

Fire: \_\_\_\_\_  
 Ele.: \_\_\_\_\_  
 Bldg.: \_\_\_\_\_

Signature of Installer [Signature]

**Approved with Conditions**

See attached letter or requirement

Inspector's Signature \_\_\_\_\_ Date Approved \_\_\_\_\_

White - Inspection      Yellow - File      Pink - Applicant's      Gold - Assessor's Copy

**City of Portland, Maine - Building or Use Permit Application**

389 Congress Street, 04101 Tel: (207) 874-8703, FAX: (207) 8716

Job No: 2011-10-2349-HVAC	Date Applied: 10/4/2011	CBL: 033- B-008-001	
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Lessee/Buyer's Name:	Phone:	Permit Type: HVAC - HVAC	Zone: B-2b
Past Use: Public Services Facilities	Proposed Use: Public Services Facilities – to install new heating system – Hydrotherm KN6	Cost of Work: \$82,000.00	CEO District:
		Fire Dept: <input checked="" type="checkbox"/> Approved w/conditions <input type="checkbox"/> Denied <input type="checkbox"/> N/A	Inspection: Use Group: HVAC Type:
Proposed Project Description: Hydrotherm KN6		Signature: <i>Capt. Pitone 10/10/11</i>	Signature: <i>[Signature]</i>
Permit Taken By: Planning		Zoning Approval	

<p>1. This permit application does not preclude the Applicant(s) from meeting applicable State and Federal Rules.</p> <p>2. Building Permits do not include plumbing, septic or electrical work.</p> <p>3. Building permits are void if work is not started within six (6) months of the date of issuance. False informatin may invalidate a building permit and stop all work.</p>	<p><b>Special Zone or Reviews</b></p> <p><input type="checkbox"/> Shoreland</p> <p><input type="checkbox"/> Wetlands</p> <p><input type="checkbox"/> Flood Zone</p> <p><input type="checkbox"/> Subdivision</p> <p><input type="checkbox"/> Site Plan</p> <p>___ Maj ___ Min ___ MM</p> <p>Date: <i>06 10/5/11</i></p>	<p><b>Zoning Appeal</b></p> <p><input type="checkbox"/> Variance</p> <p><input type="checkbox"/> Miscellaneous</p> <p><input type="checkbox"/> Conditional Use</p> <p><input type="checkbox"/> Interpretation</p> <p><input type="checkbox"/> Approved</p> <p><input type="checkbox"/> Denied</p> <p>Date:</p>	<p><b>Historic Preservation</b></p> <p><input checked="" type="checkbox"/> Not in Dist or Landmark</p> <p><input type="checkbox"/> Does not Require Review</p> <p><input type="checkbox"/> Requires Review</p> <p><input type="checkbox"/> Approved</p> <p><input type="checkbox"/> Approved w/Conditions</p> <p><input type="checkbox"/> Denied</p> <p>Date: <i>[Signature]</i></p>
	<p><b>CERTIFICATION</b></p>		

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the appication is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provision of the code(s) applicable to such permit.

SIGNATURE OF APPLICANT	ADDRESS	DATE	PHONE
RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE		DATE	PHONE



HTN1-1110

# PRODUCT DATA

## COMMERCIAL KN SERIES

### Control and Communications Distributed Modulating Boiler Control

HeatNet, Hydrotherm's proprietary integrated boiler management system is the driving force behind Hydrotherm's energy optimization philosophy for its high efficiency equipment and is standard equipment on all Commercial KN Series Air-Fuel coupled products. Designed for precise system control, HeatNet provides repeatability and feedback thru digital communication. The control monitors boiler temperatures and circuit limit inputs, maintains space heating and domestic hot water requirements, supports boiler room components including system/domestic pump, boiler pump, combustion air damper and modulates boiler firing rate to maximize turndown ratios in order to maintain peak efficiency.

Developed and manufactured by Hydrotherm's sister company Mestek Technologies, HeatNet provides an intuitive interface with plug-and-play connections to speed the set-up and diagnostic process for installing contractors. HeatNet is capable of operating Hydrotherm units as a stand-alone boiler, multi-boiler Master/Member network protocol of up to 16 boilers or to a Boiler Management System. The network can incorporate mixing of condensing, non-condensing boilers or base loading an existing boiler based on conditional and priority firing – all of which eliminate the need for an additional third party wall-mounted control platform.

The control configuration "learns" the applications optimal firing rates by using microprocessor electronics to monitor time-average responses based on actual usage to determine the load for the system for optimal energy efficiency. Standard HeatNet controls use a Modbus protocol with optional processor boards for BACnet and LonWorks based building management systems, which eliminates the need for analog control signals. The use of analog control signals is still supported, but a higher level of control precision, repeatability, and feedback is gained with digital communications control. Typical master/member systems using 2, 3 or 4 boiler configurations can see a total turndown ratio of 10, 15 or even 20:1!

Variable control settings for Mod/Max firing rates allow adjustable maximum firing rates (factory pre-set at 70%) enabling all boilers to run at extremely efficient levels until all units in the sequence have fired at which time firing rates can increase above the standard setting to meet system demands. Firing rate is kept as low as possible to take advantage of increased efficiency at lower inputs. Boiler firing rotations can be programmed for first on/first off, first on/last off or "True Rotation" which rotates boiler run-times so that all units run for the same amount of time.

HeatNet's proprietary design allows for seamless flash drive or laptop driven updateable firmware adding continuous value and boiler system control without the need for physical control platform updates that can make some equipment obsolete. Electronics are located in control cabinet through which all internal components and terminal blocks are easily accessed via a hinged, swing open door panel on the front of all units.

#### CONTROL FEATURES

- A. Boiler to Boiler Communication – HeatNet Protocol for up to 16 Boilers
- B. Modbus Protocol for BMS Interface
- C. BACnet IP/MSTP and LonWorks Protocol (Optional)
- D. Menu Driven Calibration and Setup Menus with Bright (Adj.) 4-Line Vacuum Fluorescent Display
  - Set Point Control
  - Outdoor Reset
  - Night Setback
  - Domestic Hot Water (Priority/Non Priority)
  - Digital/Analog Communication
  - System/Local Pump Control
  - Combustion Air Damper
  - Monitor Min Return Temp – Copper Fin
  - Heat Exchanger Delta T (Limits to Half Fire)
  - Firmware Loading – Flash Drive or USB Cable
  - Fail Safe Mode – Member Boilers
  - First Boiler ON – Venting
  - Min Boiler Off Time
  - Add Boiler Delay Timing
  - Shed Boiler Delay Timing
  - Adaptive Modulation – Prevents Short Cycling
  - Modulate Delay Time (Low Fire Hold)
  - (5) Dedicated Temperature Sensor Inputs for: Outside Air Temp., Supply (Outlet) Temp., Return (Inlet) Temp., Header Temp. and DHW
  - Min/Max VFD – Load Match (low fire); Input Adjustment (Elevation, Direct Vent)
  - Log Entry – Troubleshoot and Diagnostic Tool – Records Major Activity of Boiler Operation
  - Five levels of External Control Inputs: On/Off, Staging, RS485 Digital Comm, BMS (4-20 mA) and HeatNet Heat Demand
  - Priority Levels for Condensing and Non Condensing Boilers in a Common System
  - Base Load Boiler Control

260 NORTH ELM STREET  
WESTFIELD, MA 01085  
(413) 564-5515 • FAX (413) 568-9613

**HydroTherm**<sup>®</sup>

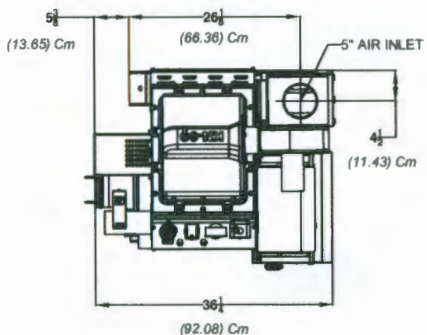


7555 TRANMERE DRIVE  
MISSISSAUGA, ONTARIO L5S 1L4 CANADA  
(905) 672-2991 • FAX (905) 672-2883

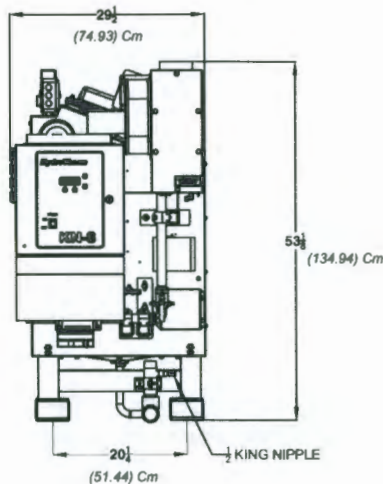
**CODE OPTIONS**

<b>CSD-1</b>	STANDARD
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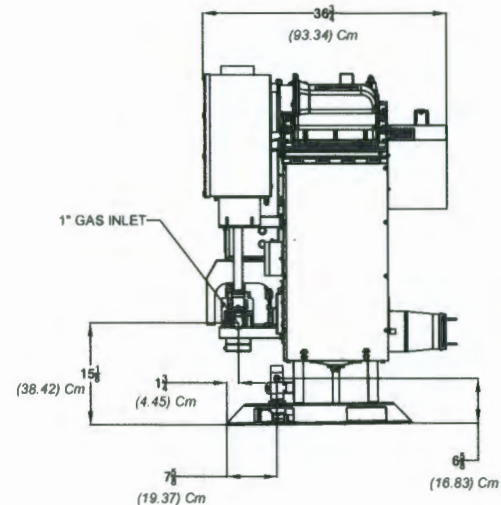
**NOTE:** Dimensions are approximate and should not be used to "rough-in" equipment.



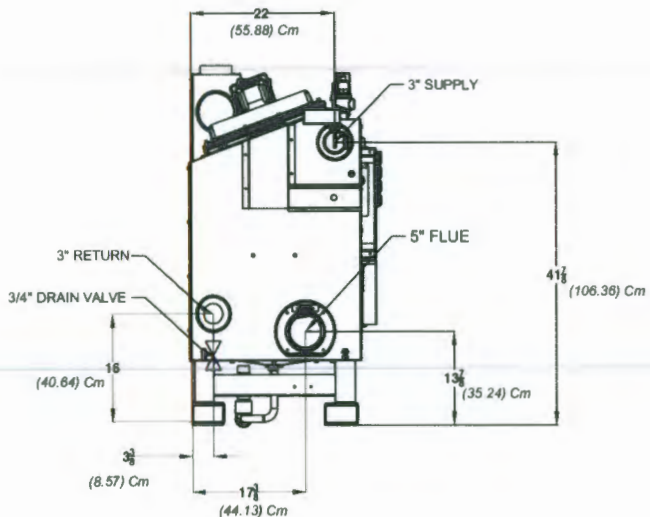
**TOP VIEW**



**FRONT VIEW**



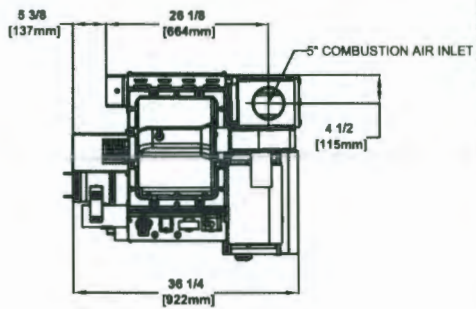
**SIDE VIEW**



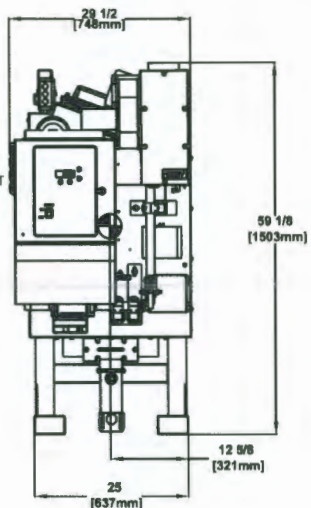
**REAR VIEW**

<b>REP FIRM</b>	_____	<h1 style="margin: 0;">KN-6</h1> <p style="margin: 0;"><b>Category II or Category IV Appliance</b> (see Installation and Operation Manual for venting information)</p> <p style="margin: 0;"><b>HydroTherm</b> A Product of ADVANCED THERMAL HYDRONICS A Division of Mestek, Inc. Westfield, MA 01085 (413) 564-5515</p>
<b>SUBMITTED BY</b>	_____	
<b>JOB NAME</b>	_____	
<b>ARCHITECT</b>	_____	
<b>ENGINEER</b>	_____	
<b>CONTRACTOR</b>	_____	
<b>DATE</b>	_____	

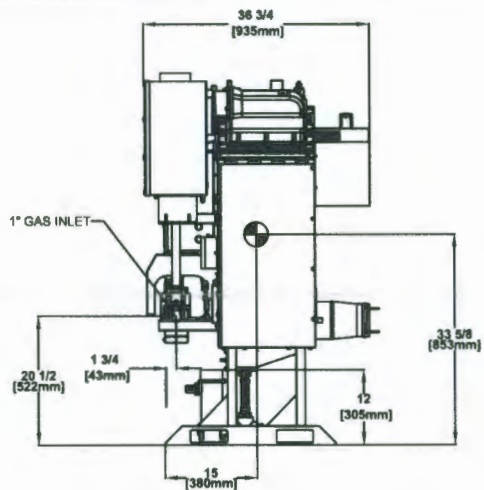




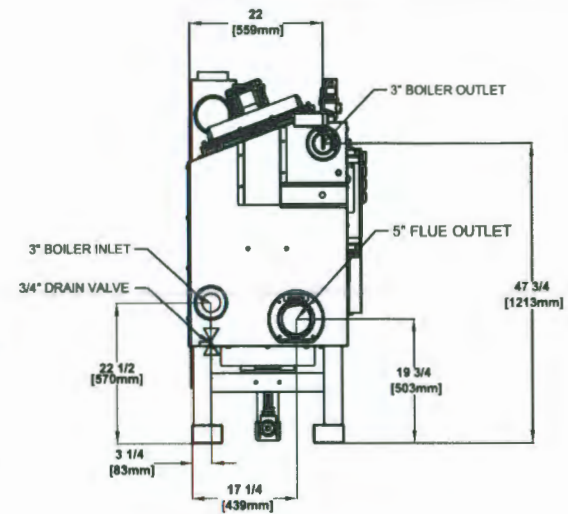
LEFT SIDE



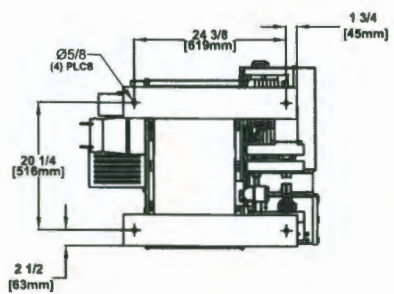
FRONT



RIGHT SIDE



REAR

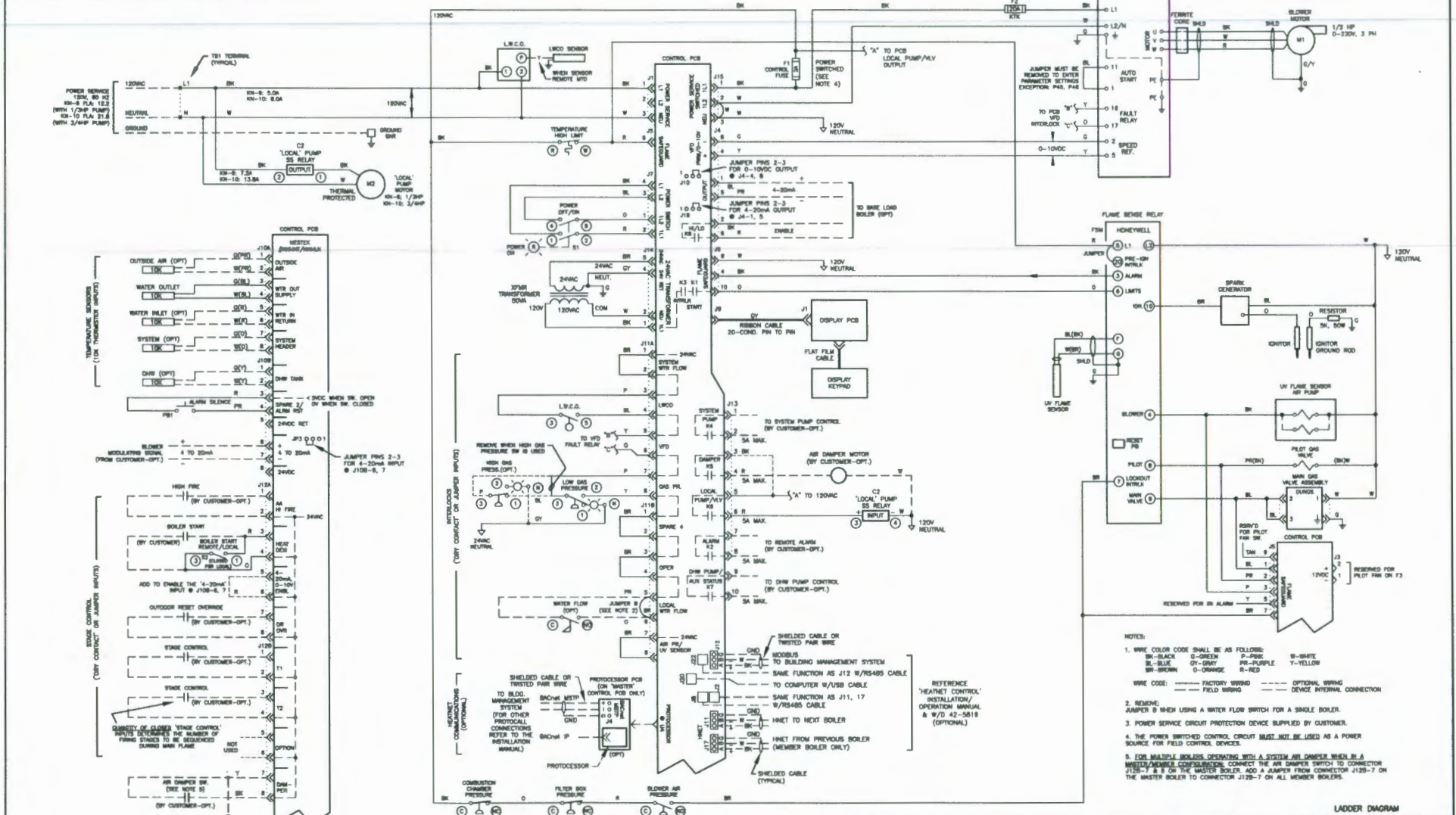


BOTTOM

**NOTE:** Dimensions are approximate and should not be used to "rough in" equipment.



CHANGES	APPR. BY:
REV 1	JPC
ECN 3367	7/29/10
ADDED J4-1,2,5,6 FOR BASE LOAD BOILER; REMOVED UV AIR PRESS. SW. FROM J11B-7, 8	RF

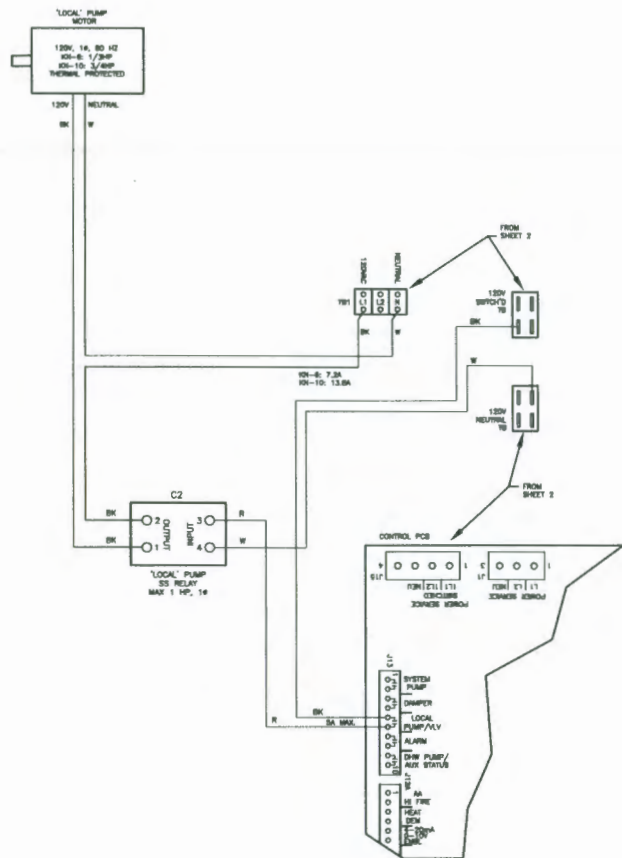


- NOTES:
- WIRE COLOR CODE SHALL BE AS FOLLOWS: BK-BLACK, G-GREEN, P-PINK, W-WHITE, BL-BLUE, GR-GRAY, PL-PURPLE, Y-YELLOW, BR-BROWN, O-ORANGE, R-RED.
  - REMOVE JUMPER B WHEN USING A WATER FLOW SWITCH FOR A SINGLE BOILER.
  - POWER SERVICE CIRCUIT PROTECTION DEVICE SUPPLIED BY CUSTOMER.
  - THE POWER SWITCHED CIRCUIT MUST NOT BE USED AS A POWER SOURCE FOR FIELD CONTROL DEVICES.
  - FOR MULTIPLE BOILERS OPERATING WITH A SYSTEM AIR DAMPER WHEN IN A MASTER/MEMBER CONFIGURATION, CONNECT THE AIR DAMPER SWITCH TO CONNECTOR J12B-7 & 8 ON THE MASTER BOILER. ADD A JUMPER FROM CONNECTOR J12B-7 ON THE MASTER BOILER TO CONNECTOR J12B-7 ON ALL MEMBER BOILERS.

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<b>HydroTherm</b> 280 North Elm Street Westfield, Mass. 01080	<b>#KN-6, 10</b> <b>WIRING DIAGRAM</b> <b>WHNET/HLK CONTROL BOARD</b>		SCALE: NONE DR. BY: R.T. DATE: 5/27/10	SHEET: 1 OF 3 DWG. NO.: B DRAWING NUMBER: 42-5825	R. C.
	LADDER DIAGRAM				

CHANGES		APPR. BY:	
RELEASED UNDER CN 3354		JPC	
REV 1	ECN 3367	7/29/10	RF
REVISED SHEETS 1, 2		RT	



NOTES:

- WIRE COLOR CODE SHALL BE AS FOLLOWS:  
 BK-BLACK G-GREEN P-PINK W-WHITE  
 BL-BLUE GR-GRAY PR-PURPLE Y-YELLOW  
 BR-BROWN O-ORANGE R-RED

WIRE CODE: \_\_\_\_\_ FACTORY WIRING  
 \_\_\_\_\_ FIELD WIRING  
 \_\_\_\_\_ OPTIONAL WIRING

ALL WIRES SHALL BE #18AWG UNLESS SPECIFIED. WIRE TYPE SHALL BE TWY BODY, STRANDED 18/30, WITH INSULATION RATED FOR 105° OR EQUIVALENT.  
 USE CABLE TIES, CABLE FASTENERS, SPADE TERMINALS, WIRE CONNECTORS, WIRENUTS, ETC. AS REQUIRED.

TOLERANCES  
 (UNLESS OTHERWISE SPECIFIED)  
 ± .1/32 ON FRACTIONAL DIM'S  
 ± .008 ON DECIMAL DIM'S  
 DIM'S IF NOT (SEE NOTE 1)  
 ± .01 ON WHOLE DIM'S

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**HydroTherm**  
 280 North Elm Street  
 Westfield, Mass. 01085

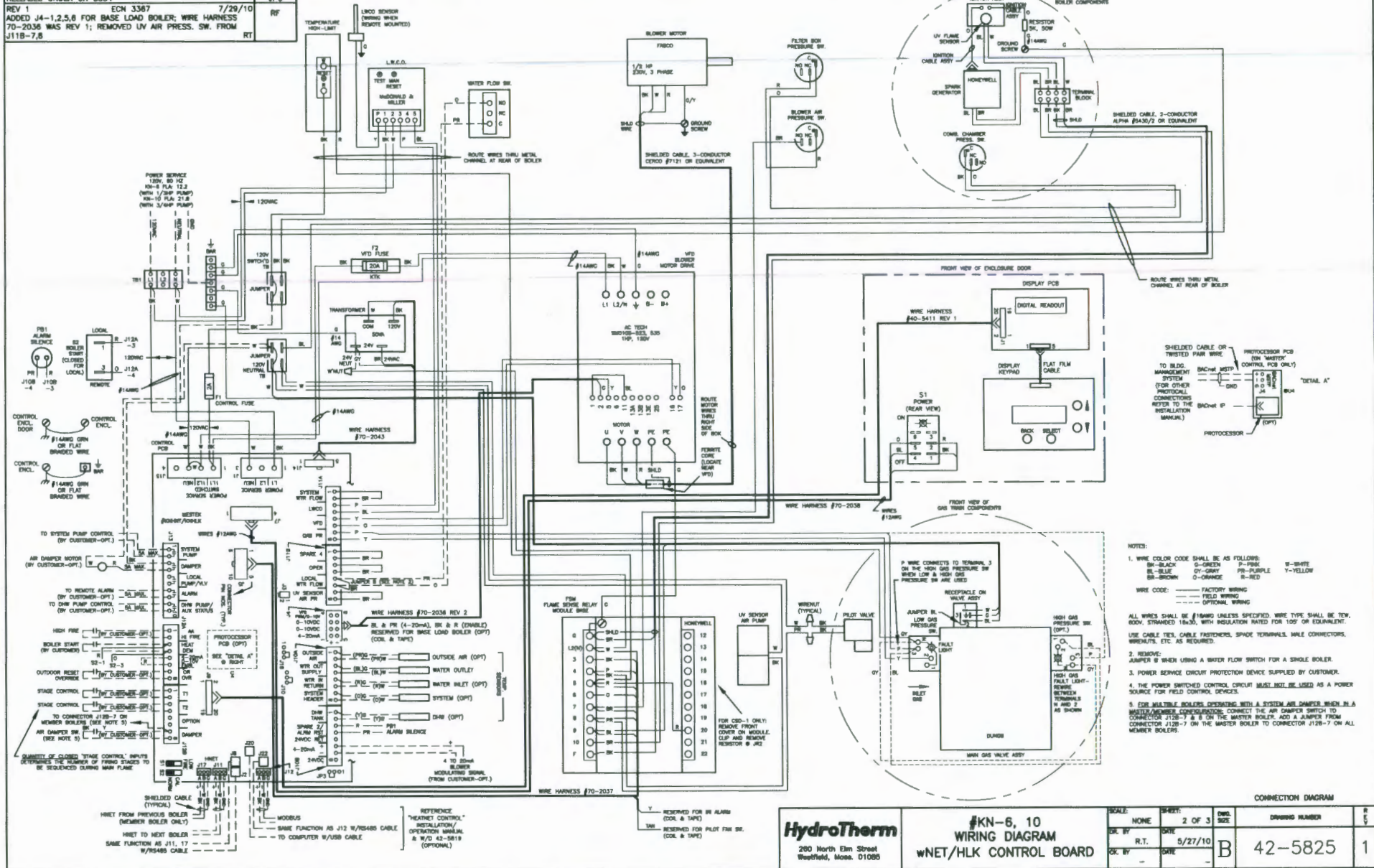
#KN-6, 10  
 WIRING DIAGRAM  
 WHNET/HLK CONTROL BOARD

SCALE:	SHEET:	DWG. NO.:	DWGING NUMBER	R
NONE	3 OF 3			
DR. BY:	DATE:	DWG. NO.:		
R.T.	5/27/10			
CHK. BY:	DATE:			
		B	42-5825	1

CONNECTION DIAGRAM

CHANGES  
 RELEASED UNDER CN 3354  
 REV 1 ECN 3367 7/29/10  
 ADDED J4-1,2,5,6 FOR BASE LOAD BOILER; WIRE HARNESS  
 70-2036 WAS REV 1; REMOVED UV AIR PRESS. SW. FROM  
 J118-7,8 RT

APPR. BY:  
 JPC  
 RF



- NOTES:
1. WIRE COLOR CODE SHALL BE AS FOLLOWS:  
 BK-BLACK G-GREEN P-PINK  
 BL-BLUE OY-GRAY PR-PURPLE Y-YELLOW  
 BR-BROWN O-ORANGE R-RED
  2. REMOVE JUMPER B WHEN USING A WATER FLOW SWITCH FOR A SINGLE BOILER.
  3. POWER SERVICE CIRCUIT PROTECTION DEVICE SUPPLIED BY CUSTOMER.
  4. THE POWER SWITCHED CONTROL CIRCUIT MUST NOT BE USED AS A POWER SOURCE FOR FIELD CONTROL DEVICES.
  5. FOR MULTIPLE BOILER SYSTEMS WITH A SYSTEM AIR DAMPER WHICH IS A MASTER/DAMPER CONFIGURATION, CONNECT THE AIR DAMPER SWITCH TO CONNECTOR J128-7 & 8 ON THE MASTER BOILER. ADD A JUMPER FROM CONNECTOR J128-7 ON THE MASTER BOILER TO CONNECTOR J128-7 ON ALL MEMBER BOILERS.
- WIRE CODE: --- FACTORY WIRING  
 --- FIELD WIRING  
 --- OPTIONAL WIRING
- ALL WIRES SHALL BE #18AWG UNLESS SPECIFIED. WIRE TYPE SHALL BE TW, BOV, STRANDED 18-20, WITH INSULATION RATED FOR 100% OR EQUIVALENT.
- USE CABLE TIE, CABLE FASTENERS, SPACE TERMINALS, MALE CONNECTORS, WIRENUTS, ETC AS REQUIRED.

<b>HydroTherm</b> 280 North Elm Street Wetfield, Mass. 01085		<b>#KN-6, 10 WIRING DIAGRAM wnet/hlk CONTROL BOARD</b>		SCALE: NONE	SHEET: 2 OF 3	DWG. SIZE: B	DRAWING NUMBER: 42-5825	REV: 1
DR. BY: R.T.	DATE: 5/27/10			OK. BY:	DATE:			

REFERENCE "HEATNET CONTROL" INSTALLATION/OPERATION MANUAL & W/D 42-5819 (OPTIONAL)

MODELS:  
 SAME FUNCTION AS J13 W/RESERVE CABLE  
 TO COMPUTER W/USB CABLE

SHIELDED CABLE (TYPICAL)  
 HIET FROM PREVIOUS BOILER (MEMBER BOILER ONLY)  
 HIET TO NEXT BOILER  
 SAME FUNCTION AS J11, 17 W/RESERVE CABLE

FOR CSD-1 ONLY: REMOVE FRONT COVER ON MODULE, CLIP AND REMOVE RESISTOR @ J42.

RESERVED FOR IN ALARM (COX & TAP)  
 RESERVED FOR PILOT FAN SW. (COX & TAP)



**A.G.A. CERTIFIED RATINGS & CAPACITIES**

<b>Fuel Type</b>	Natural Gas	<b>Boiler FLA</b>	5 AMPS
<b>Input BTU/hr.</b>	600 MBH/ 176 KW	<b>Min. Gas Pressure Required</b>	2" W.C.
<b>Output BTU/hr.</b>	528" MBH/ 155 KW	<b>Max. Gas Pressure Allowed</b>	14" W.C.
<b>Boiler HP</b>	16	<b>Water Volume</b>	9.5 gal.
<b>Electrical Requirements</b>	120VAC/ 60 hz/ 1PH	<b>Operating Weight</b>	737 lbs. / 334 kg.

\* Based on efficiency curve

**BOILER TRIM & CONTROLS**

<b>Main Gas Valve</b>	Dungs DMV-SE512/11	<b>Manual Pilot Valve</b>	Honeywell V8046C
<b>Firing Valve</b>	1" Apollo	<b>Air Switch</b>	Huba Type 605
<b>Ignition Control</b>	Honeywell RM7800	<b>Blower Motor</b>	Fasco 1/2 HP
<b>Operating Control (FB/FW)</b>	HeatNet™	<b>L.W.C.O.</b>	750P-MT-120
<b>High Limit</b>	Honeywell L4006E	<b>Relief Valve - FW</b>	30, 50, 75 & 100 PSI
<b>Main Ball Valve</b>	1" Apollo	<b>Variable Speed Drive</b>	KBVF-14
<b>Pilot Cock</b>	1/4" Conbraco	<b>Pilot Regulator</b>	MAXITROL RV12LT

**TEMPERATURE RISE / PRESSURE DROP (Based on Full Input)**

20° F / 11.1° C		40° F / 22.2° C		60° F / 33.3° C		80° F / 44.4° C		100° F / 55.5° C											
Flow Rate	Pressure Drop	Flow Rate	Pressure Drop	Flow Rate	Pressure Drop	Flow Rate	Pressure Drop	Flow Rate	Pressure Drop										
GPM	L/s	Ft	kPa	GPM	L/s	Ft	kPa	GPM	L/s	Ft	kPa								
60.0	3.79	2.31	6.91	30.0	1.90	.58	1.73	20.0	1.26	.26	.78	15.0	.95	.14	.42	12.0	.78	.09	.27

Flow GPM		Temp. Rise (°F)		Vent Length (Equiv. Ft.)		Air Inlet Length (Equiv. Ft.)	
Min	Max	Min	Max	Min	Max	Min	Max
10*	100	20	100	6	80	0	80

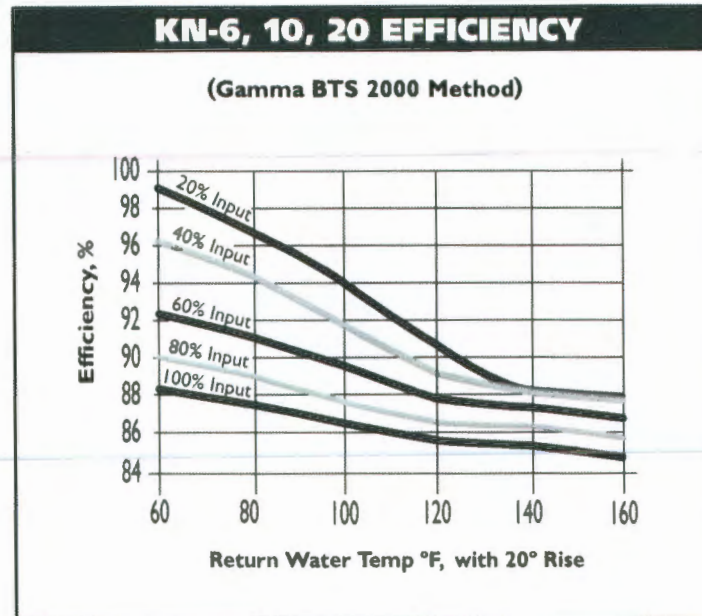
\* At 100% input

**A.S.M.E.**

<b>ASME Sect IV Htg Surface</b>	21.168 Sq. Ft. / 1.97 Sq. M.	<b>Design Data</b>	100 PSI & 250° F
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**UNBALANCED FLUE LIMITATIONS**

<b>Negative Flue Pressure</b>	-2" W.C.
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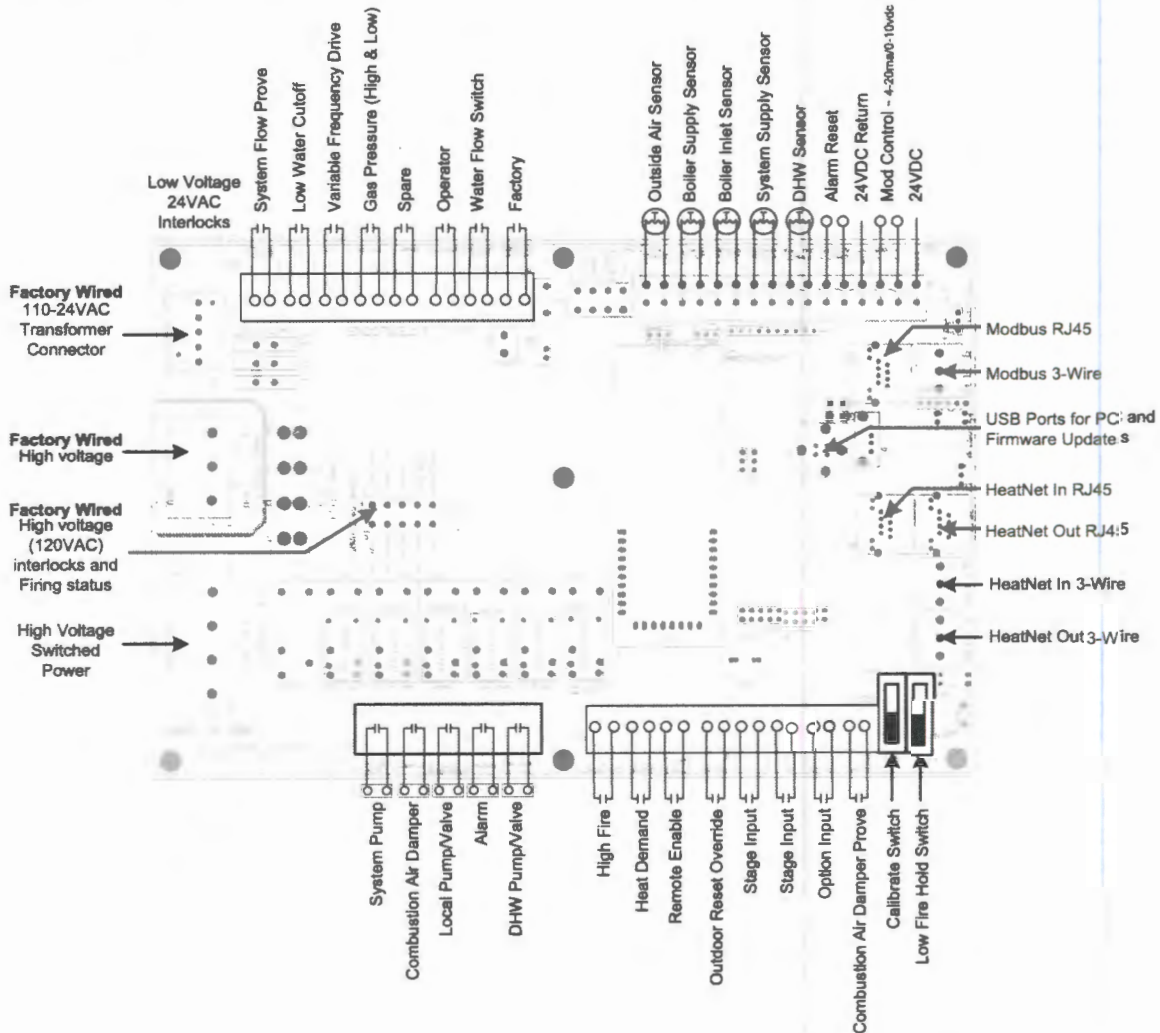




**Control and Communications  
Distributed Modulating  
Boiler Control**

**COMMERCIAL  
KN SERIES**

**Typical Wiring Diagram**



**SPECIFICATIONS**

**Boiler-to-Boiler:**  
HeatNet™

**Control:**  
Microprocessor based PID  
modulating control  
(NOT a safety limit)

**Environment:**  
-40°F to 140°F, <90% RH  
non-condensing

**Input Power:**  
24 VAC, 250 ma

**Switched Line:**

120 VAC single phase, 240 VAC  
single phase

**Relays:**

Stage, Circulator, Alarm 8A  
250 VAC

**AC Interlocks:**

24 VAC – 120 VAC input

**Approvals:**

CSA Approved as integral part of boiler

**USB - 1.0**

**RS485 Modbus Communication:**

Modbus RTU, 19200 baud, 8 bits,  
Even Parity, 1 Stop Bit

**Temperature Sensors:**

NTC thermistor, 10K @ 77°F,  
335.67K @ -40°F, 185 @ 150°F,  
+/- 1°F

- Return, Supply and Common Header Sensors (10k) supplied as standard
- Outside Air Sensor (10k) with housing is optional
- DHW Sensor 10K

**Communications Environment:**

-40°F to 140°F, <90% RH  
non-condensing