



**INSTANT-PAK[®], TYPE NH
MODELS 188 & 208 DV**

Catalog No.: 3500.82
Effective: 7/1/11
Replaces: New

DIVISION 23 34 36.29

COMMERCIAL, WATER-TUBE, GAS TANKLESS WATER HEATERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes Near-Condensing Gas-Fired, Copper Tube Tankless Water Heaters

Specifier Note: Use as needed

B. Related Sections

1. Building Services Piping – Division 22 11 00
2. Breeching, Chimneys, and Stacks (Venting) – Division 23 51 00
3. HVAC Instrumentation and Controls – Division 23 09 00
4. Electrical – Division 23 09 33

1.2 REFERENCES

- A. ANSI Z21.10.3 /CSA 4.3
- B. 2006 UMC, Section 1107.6
- C. ANSI/ASHRAE 15-1994, Section 8.13.6
- D. National Fuel Gas Code, ANSI Z223.1/NFPA 54
- E. National Electrical Code, ANSI NFPA 70

1.3 SUBMITTALS

- A. Product data sheet (including dimensions, rated capacities, shipping weights, accessories)
- B. Wiring diagram
- C. Warranty information
- D. Installation and operating instructions

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements
 1. ANSI Z21.10.3/CSA 4.3
 2. Local and national air quality regulations for low NO_x (<20 PPM NO_x emissions) water heaters
- B. Certifications
 1. CSA
 2. NSF
 3. SCAQMD

1.5 HEAT EXCHANGER WARRANTY

- A. Five-year heat exchanger warranty in commercial applications

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Raypak, Inc.
1. Contact: 2151 Eastman Ave., Oxnard, CA 93030; Telephone: (805) 278-5300; Fax: (800) 872-9725; Web site: www.raypak.com
 2. Product: Instant-Pak[®] Near Condensing Tankless Hot Water heater(s)

2.2 HEATERS

A. General

1. The heater(s) shall be fired with _____ gas at a rated input of _____ BTU/hr.

2. The heater(s) shall be CSA tested and certified with a minimum Energy Factor of .82 at full fire.
 3. The heater(s) shall have a maximum weight of 54 lbs. or less.
- B. Heat Exchanger
1. The heat exchanger shall be a singular copper tube with serpentine nine pass design and shall have integral copper walls extending into the combustion chamber for maximum efficiency.
 2. 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 heater from the site.
 3. The low water volume heat exchanger shall be explosion-proof on the water side.
 4. The concentric flue connection and combustion air opening shall be located on the top of the heater.
 5. The gas connection, electrical connections, water connections shall be located on the bottom of the heater.
- C. Burners
1. The combustion chamber shall be of the sealed combustion type employing 11 Raypak high temperature stainless steel ribbon burners, mounted onto a gas manifold.
 2. The burner shall be a proprietary "Rich-Lean" design and constructed of high grade stainless steel and must be capable of firing at both a complete blue flame with maximum gas and air input as well as firing near infrared when gas and air are reduced. The burner must be capable of firing at 100% of rated input when supplied with **4.0" WC** of inlet gas pressure, so as to maintain service under heavy demand conditions; no exceptions.
 3. The burner shall use a combustion air blower to precisely control the fuel/air mixture for maximum efficiency throughout the entire range of modulation. The combustion air blower shall operate for a pre-purge period before burner ignition and a post-purge period after burner operation to clear the combustion chamber.
 4. The blower shall infinitely vary its output in response to a signal supplied directly from the integrated modulating control, thereby electronically and precisely adjusting the volume of air and gas supplied for combustion. Minimum fire shall be 6.25 percent of rated input.
- D. Ignition System
1. The heater(s) shall be equipped with a 100 percent safety shutdown.
 2. The ignition shall be spark ignition type with full flame rectification by the ignition source, with a three try-for-ignition sequence, to ensure consistent operation.
 3. The igniter will be located to the side of the heat exchanger to protect the device from condensation during start-up.
 4. The ignition control module shall include a three segment LED display that indicates **up to 6 individual diagnostic faults.**
 5. A viewing port shall be provided, (accessed after removal of front cover) permitting visual observation of burner operation.
- E. Gas Train
1. The heater(s) shall have dual-seated main gas valve.
 2. Gas control trains shall have a redundant safety shut-off feature, main gas regulation, **and plugged pressure tapping** to meet the requirements of ANSI Z21.10.3/CSA 4.3.
- F. Heater Control
1. The following safety controls shall be provided:
 - a. High limit control with manual reset
 - b. Water Pressure switch, mounted and wired
 - c. Flame position based combustion and blocked flue sensor
 - d. Guardian OFW™ Overtemp breach protection safety device
 2. The heater(s) shall be equipped with an integrated modulating temperature controller with a 3-segment LED display.

3. **The heater shall allow for remote control and have built-in “Cascade” to sequence and rotate while maintaining modulation of up to two heaters without utilizing an external sequencer and up to 20 with an external sequencer.**

G. Firing Mode: Provide electronic modulating control of 16 to 1 for the gas input to the heater.

H. Heater Diagnostics

1. Provide internal circuit board indicating the following safety faults by a 3 character, LCD display:
 - a. **System Function and Status**
 - b. **Ignition lock-out**

I. Cabinet

1. The corrosion-resistant galvanized-steel jackets shall be finished with a baked-on **powder coat**, which is suitable for outdoor installation, applied prior to assembly for complete coverage.
2. The heater(s), if located on a combustible wall, shall not require a separate combustible wall shield.
3. The heater(s) shall connect both the combustion air and flue products through the top of the unit.

2.3 HEATER OPERATING CONTROLS

- A. **The heater(s) shall feature a modulating digital controller, shipped loose for wiring to the heater as required.**
- B. **The heater(s) shall have the ability to have a receptacle and communication protocol via the “easy link” cable that allows two heaters to work as one virtual heater with double the firing rate of a single heater.**
- C. **Inlet/Outlet sensors are pre-wired and factory-installed.**

2.4 DIRECT VENT

- A. The heater(s) shall meet safety standards for direct vent equipment as noted by the 2006 Uniform Mechanical Code, section 1107.6, and ASHRAE 15-1994, section 8.13.6.
- B. **The heater shall be capable of combined combustion air duct and vent lengths not to exceed 39 equivalent feet with one elbow.**

2.5 SOURCE QUALITY CONTROL

- A. The heater(s) shall be completely assembled, wired, and fire-tested prior to shipment from the factory.
- B. The heater(s) shall be furnished with the sales order, wiring diagram, rating plate and Installation and Operating Manual.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Must comply with:
 1. Local, state, provincial, and national codes, laws, regulations and ordinances
 2. National Fuel Gas Code, ANSI Z223.1/NFPA 54 – latest edition
 3. National Electrical Code, ANSI/NFPA 70 – latest edition
 4. Canada only: CAN/CSA B149 Installation Code and CSA C22.1 CEC Part I
 5. Manufacturer’s installation instructions, including required service clearances and venting guidelines
- B. Manufacturer’s representative to verify proper and complete installation.

3.2 START-UP

- A. Shall be performed by Raypak factory-trained personnel.
- B. Test during operation and adjust if necessary:
 1. Safeties

2. Operating Controls
 3. Static and full load gas supply pressure
 4. Combustion analysis
- C. Submit copy of start-up report to Contractor / Maintenance Engineer and Customer.

3.3 TRAINING

- A. Provide factory-authorized service representative to train maintenance personnel on procedures and schedules related to start-up, shut-down, troubleshooting, servicing, and preventive maintenance.
- B. Schedule training at least seven days in advance.

END OF SECTION