KN SERIES

MADE IN THE USA

KN SERIES

Gas-Fired Cast Iron Boilers Models KN-6, -10, -16, -20, -26, -30 and -40

Field Assembly Instructions

Also read and follow:

KN Series Gas Boiler Installation and Operating Instructions

and

KN HeatNet Control Manual

WARNING This manual is intended only for use by a qualified heating installer/technician. Read and follow this manual, all supplements and related instructional information provided with the boiler. Install, start and service the boiler only in the sequence and methods given in these instructions. Failure to do so can result in severe personal injury, death or substantial property damage.

WARNING **Do not use the boiler during construction.** Construction dust and particulate, particularly drywall dust, will cause contamination of the burner, resulting in possible severe personal injury, death or substantial property damage. The boiler can only be operated with a dust-free air supply. Follow the instruction manual procedures to duct air to the boiler air intake. If the boiler has been contaminated by operation with contaminated air, follow the instruction manual guidelines to clean, repair or replace the boiler if necessary.

CAUTION Affix these instructions near to the boiler/water heater. Instruct the building owner to retain the instructions for future use by a qualified service technician, and to follow all guidelines in the User's Information Manual. Dimensions are in INCHES (IN), FEET (FT), MILIMETERS [mm] or METERS [m].

INFORMATION

This manual is intended only for the field assembly of a KN-6, -10, -16, -20, -26, -30 or -40 boiler. Follow the assembly instructions in sequence. Also follow all requirements of the KN Boiler manual and the KN HeatNet manual.

NOTICE These instructions show the block assembly beginning with the front section and finishing with the back section.

If job conditions make this impractical, the block can be built beginning with the back section and finishing with the front.

Hazard Icons

You will find the following icons throughout this manual. (English/French)

WARNING The **WARNING** icon indicates a hazard that can cause ***severe personal injury, death or substantial property damage.***

CAUTION The **CAUTION** icon indicates a hazard that will or can cause ***minor personal injury or property damage.***

NOTICE The **NOTICE** icon calls out special instructions that are important, but are not related to hazards.

Other Manuals

WARNING You must read and follow these instructions, the KN Series Gas Boiler Installation and Operating Instructions, the KN HeatNet Control manual and all additional materials supplied with the boiler. Failure to do so can result in severe personal injury, death or substantial property damage!

Boiler/Control Installation And Setup

After completing assembly of the KN boiler, follow all instructions in the Installation and Operation Instructions and Control Manual for installation, start-up and testing.

READ BEFORE PROCEEDING

Customer Service And Technical Support

Direct all questions to your distributor or contact the Advanced Thermal Hydronics Customer Service Department at: 260 North Elm Street, Westfield, MA 01085. Always include the model and serial numbers from the rating plate of the boiler in question.

Claims for damage or missing components must be filed immediately against the transportation company by the consignee.

CODES AND STANDARDS

All aspects of the boiler installation must conform to the requirements of the authority having jurisdiction, or, in the absence of such requirements, to the National Fuel Gas Code, ANSI Z223.1/NFPA 54-latest revision. Where required by the authority having jurisdiction, the installation must conform to the Standard for Controls and Safety Devices for Automatically Fired Boilers, ANSI/ASME CSD-1. In Canada, the installation must be in accordance with the requirements of CSA B149.1 or .2, Installation Code for Gas Burning Appliances and Equipment.

BEFORE ASSEMBLING THE BOILER

Verify Boiler Rating And Gas Supply

- Before assembling and installing the boiler, check the ratings to ensure that the unit has been sized properly for the job.
- Ensure that the boiler will be set up for the type of gas available at the installation site.

Verify Location Is Suitable

- Ensure the availability of an adequate electrical supply, uncontaminated air for combustion, and that vent (and air) piping can be correctly installed.
- Ensure the boiler can be connected to system water piping and gas supply.
- The boiler must not be exposed to dripping or spraying water or to rain.
- If replacing an existing boiler, fi nd out what caused the boiler to fail before installing a new boiler. Correct the problems that led to failure, or the failure may happen to the new boiler.

ATTENTION:

WARNING Use of an approved dust respirator is strongly recommended when handling the insulating components of the boiler!

WARNING Electrical shock hazard — Disconnect all electrical power sources to the boiler before making any electrical connections!

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation! Verify proper operation after servicing.

Failure to comply with the above could result in severe personal injury, death or substantial property damage!

NOTICE The electrical connections to this boiler must be made in accordance with all applicable local codes and the latest revision of the National electrical Code, ANSI/NFPA-70. Installation should also conform to CSA C22.1 Canadian Electrical Code Part I if installed in Canada. Install a separate circuit for the boiler per the provided wiring diagram. A properly rated shut-off switch should be located at the boiler. The boiler must be grounded in accordance with the authority having jurisdiction, or if none, the latest revision of the National Electrical Code, ANSI/NFPA-70.

Line voltage field wiring of any controls or other devices must use copper conductors with a minimum size of #14 awg. Use appropriate wiring materials for units installed outdoors.

WARNING DO NOT open any gas valve, or attempt to fire the boiler, until all boilers have been set up and verified following the instructions in the KN Series Gas Boiler Installation & Operating Instructions!

Failure to comply could cause a boiler failure, leading to possible severe personal injury, death or substantial property damage!

COMPONENTS AND SPECIAL TOOLS REQUIRED

Recommended Assembly Crew

NOTICE The assembly crew should be a minimum of 3 experienced technicians.

Equipment/Materials Required For Assembly

1. One quart 30-wt motor oil
2. Flexible leather work gloves
3. Dead-blow hammer with plastic face **(DO NOT use a sledge hammer)**
4. Four 12" long sections of 2" x 4" (used for cushioning when seating the push nipples)
5. Two 18 inch pipe wrenches
6. Two 2 foot long sections of 2” steel pipe
7. Crescent wrenches, 18 inch or larger, may be used for tightening the draw rod nuts (NOT tie rods). (See Step 16, for draw rod instructions.)
8. Torque wrench (at least 30 foot-pound capacity)
9. Deep socket, 11/16 inch for use with torque wrench
10. Standard hand tools.
11. Wire, wire nuts, electrical hand tools (crimper, stripper, etc.).

Boiler Components And Shipping Information

NOTICE Check the contents of the skids and crate against the **Bill of Materials/Checklist** shipped with the boiler. Use the Checklist to locate specific items throughout the assembly process. Contact your supplier if you discover any components damaged or missing.

The boiler is shipped in two skids and one crate. See the contents of the crate and skids in Figure 2, page 23.

Sealants, lubricants and adhesives supplied with boiler (see Figure 2, page 23 for location)

CAUTION Use gloves when working with these products as specified in these instructions and in the product instructions.

1. Silicone RTV-6500 HiTemp: 10-oz caulk tubes (for sealing between sections)
2. Hercules Pro Dope: 8-oz jar (for mixing with 30-wt motor oil, used as lubricant for push nipples)

Sealants and adhesives supplied by assembler.

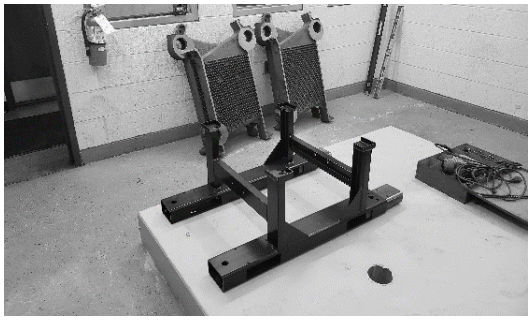
1. Loc-Tite 30557 or equivalent pipe dope: (1) 16-oz can (for water and gas piping connections)
2. Fast-Tack 87 or equivalent spray adhesive: (1) 13-oz spray can (for securing flue baffles to sections)

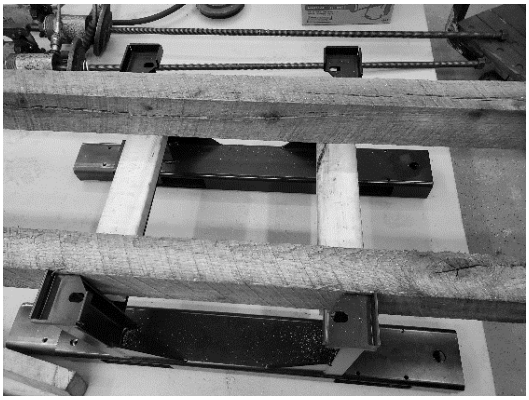
Step 1 Place runner beams on base (see BLOCK ASSEMBLY SEQUENCE NOTICE on page 2 — assembly can be from back to front if necessary)

NOTICE Make sure the boiler base is in the correct position before starting. The legs extend longer on the FRONT end of the base than on the rear end (approximately 9-1/2 inch at front and 6-3/4 inch at rear — use a tape measure if necessary to compare).

NOTICE LOCATE BOILER TO PROVIDE MINIMUM CLEARANCES FOR ASSEMBLY AND AS REQUIRED BY KN BOILER MANUAL.

The boiler must be installed in accordance with the KN Instruction Manual — the boiler location must maintain all required clearances for service and from combustible materials. Also provide **AT LEAST 60 INCHES** of clearance at the **front** of the boiler to allow room for block and condensate pan assembly.





1. Remove the base from the skid.
2. Place the supplied beams against each side of the base as shown. The KN-40 does not require beams.
3. The smooth surface of the beam must be on top.
4. If the beam has any curvature, place the beam with the curvature toward the OUTSIDE of the base.
5. Space the beams so even lengths extend out from each end of the base.
6. The beams will be used to support the boiler block during assembly, then be removed afterward.

Step 2 Oiling top surface of the beams

WARNING DO NOT allow oil to drip on the floor. Make sure the floor is free of any slick spots and that there is no debris or any obstruction in the work area or path to boiler parts!

1. Use a paint brush to spread 30-wt motor oil on the beams. This allows the sections to move easily when being drawn up.

Step 3 When lifting the sections

CAUTION Use leather gloves when lifting or moving boiler sections. Sections are heavy and can cause severe personal injury or death if mishandled.

WARNING Lift sections using two people and place in position on the beams. Make sure the section is always supported to prevent tipping or falling!

1. Lift the section with each person lifting at the top and bottom edge of the section as shown.
2. Move onto the beams and slide into position, see Step 4.
3. Handlers should lift with their legs to avoid back strain.

Step 4 Place the FRONT section in position

WARNING Have someone support the section during this step and the next. The sections are top-heavy and could easily fall if not supported!

CAUTION Handle all sections with care to prevent any damage to machined surfaces.

1. Identify the FRONT section — its lower nipple port is on the LEFT side when looking at the inside of the section, as in this photo.
2. Slide the front section to the end of the base.
3. Lift into position and have someone hold securely.

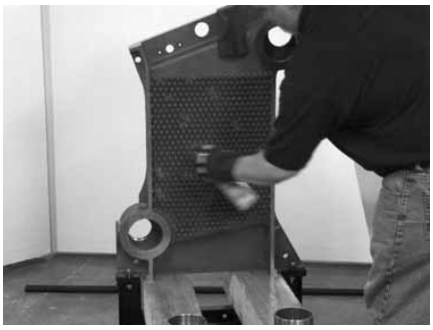
Step 5 Bolt front section to base

1. Use a 3/8” x 6 inch bolt, wedge, flat washer, split lock washer and nut on each side as shown.
2. Point wedge’s narrow end toward the section as shown.

CAUTION Tighten the bolt firmly, but DO NOT over-tighten or the cast iron flange could be broken. Tighten only until the split lock washer has just flattened.

The bolt must be secure to prevent movement of the front section during the next steps of assembly.

Step 6 Apply adhesive for ceramic fiber flue baffle



1. Use the spray adhesive noted on page 3.
2. Spray ONLY the heat transfer pins with the spray adhesive.
3. The adhesive is required to secure the flue baffle in the flue passage, see next step.

CAUTION **DO NOT spray adhesive on any of the machined surfaces**. This will prevent proper sealing with the silicone sealant applied later.

Step 7 Place ceramic fiber baffle in flue passage

WARNING Use of an approved dust mask is strongly recommended when handling the insulating components of the boiler!

CAUTION **DO NOT use broken, cracked, folded or frayed flue baffles.** Obtain replacements before proceeding with the boiler assembly.

1. The cut-off corner of the flue baffle must be next to the lower port as shown.
2. Apply spray adhesive on the backside of the flue baffle and allow it to get tacky.
3. Place the baffle against the heat transfer pins and gently press it into place.
4. Position the baffle so that it **DOES NOT overlap the machined surfaces** of the section. This would prevent the section from drawing up correctly.

Step 8 Mix push nipple lubricant

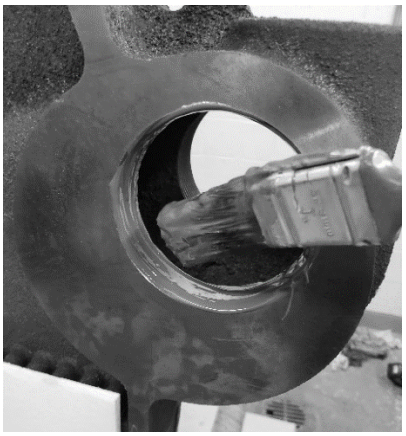
NOTICE Work gloves are recommended for this procedure.

1. In a disposable container, mix some 30-wt motor oil with some of the Hercules Pro Dope supplied with the boiler. Mix about 1 part of oil to 20 parts of the pipe dope.
2. The consistency should be similar to thick paint and should flow easily.
3. You will need enough mixture to lubricate all nipple ports and all push nipples — about 1/2 pint.

Step 9 Lubricate the push nipple ports

NOTICE **DO NOT get oil on the FACES of the nipple ports** — apply lightly and **ONLY** on the inside machined surfaces. If oil gets on a port face, wipe it off with a clean rag dipped in a solvent such as mineral spirits. Oil will prevent the silicone RTV from sticking properly.

1. Use a clean rag to wipe off all machined surfaces on both sides of the section before proceeding.
2. Also wipe clean the inside machined surfaces of both push nipple ports on front and back of section.
3. After cleaning the ports, brush the pipe dope/oil mixture on the INNER machined surfaces of the nipple ports ONLY.



Step 10 Apply Silicone RTV to machined surfaces

NOTICE Rubber gloves are recommended for this procedure. **DO NOT allow the RTV to cure before installing the next section.**

1. Apply a bead of silicone RTV (supplied with boiler) on the perimeter surfaces of the section and around the INSIDE edges of the nipple ports.
2. This is necessary to form a seal between the sections. The seal prevents flue gases from escaping.
3. Extend the bead all the way from the top of the section to the bottom.
4. Keep the bead of silicone close to the INSIDE edge of the push nipple ports.
5. This will protect the machined nipple port surfaces from condensation that may occur in the flue passages.

Step 11 Lubricate push nipples with oil/pipe dope mixture (see Step 8)

NOTICE Inspect push nipples carefully before using. **DO NOT** use a push nipple if it's gouged or scarred.

DO NOT apply excessive lubricant to the nipple ports. Lubricant can drip onto the machined sealing surface, preventing the silicone RTV from sticking.

1. Get two of the supplied push nipples.
2. Wipe the push nipples off with a clean cloth and inspect carefully.
3. Brush the outside surface of each push nipple VERY LIGHTLY with the push nipple lubricant.
4. Wipe off any excess lubricant.

Step 12 Insert the push nipples

NOTICE Avoid scarring or damaging the push nipple or nipple port surfaces. The push nipple makes a metal-to-metal seal with the nipple port. Any surface defects could cause a leak.

1. Insert a push nipple into each of the two nipple ports.
2. Press each push nipple firmly but squarely.
3. Make sure the push nipple face is as parallel to the section surface as possible.
4. DO NOT attempt to assemble sections if any push nipple is mis-aligned.

Step 13 Seat the push nipples

NOTICE Use only a dead blow hammer to seat the push nipples. DO NOT use a sledgehammer. Support the section when seating the push nipple.

1. Place a section of 2x4 across the nipple and strike firmly with a dead-blow hammer.
2. Make sure to strike in the center of the nipple to prevent tilting it.
3. Strike the 2X4 several times, so the push nipple is firmly started.
4. Look into the nipple ports from the end of the boiler. When properly seated, the push nipple edge should be slightly inside the nipple port. It should also be parallel with the inside surface.

Step 14 File lower edges of next section

NOTICE Work gloves are recommended for this procedure.

1. Use a flat file to round off the front lower edge on both sides of the next section.
2. This step will prevent the sharp edges from gouging the runner beams as the section is drawn up.

Step 15 Install next section and prepare draw rods

1. Carefully slide the first intermediate section up to the front section.
2. Before pulling the intermediate section up fully, clean the nipple ports and brush lubricant on the inside machined surfaces of the nipple ports as in Step 9.
3. Align the intermediate section to the front section and slowly move into position so both push nipples just enter the intermediate section nipple ports.

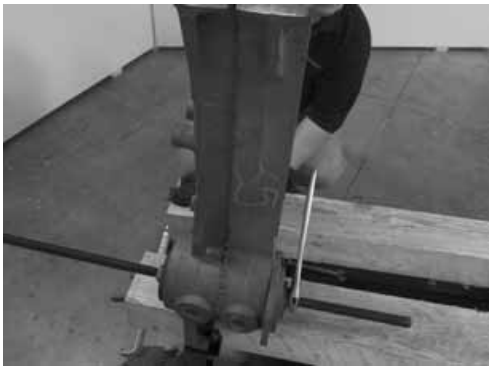
4. To initially seat the push nipple into the next section, strike with a dead blow hammer and 2x4 at each nipple port.

5. Repeat, alternating from right nipple port to left to avoid cocking the push nipples.
6. Wipe a small amount of motor oil on the 7/8 inch all-thread rods supplied with the boiler to make pull-up easier.
7. Thread a 7/8 inch nut onto the ends of both draw rods. Slide a washer and one of the bearing plates onto each of the two draw rods. The small diameter side of the bearing plates must face toward the nuts as shown below.
8. Thread the nut far enough that about 24 inches of draw rod extends beyond the bearing plate.

9. Carefully insert the draw rods through the front nipple ports. Most of the draw rod length will extend towards the front.
10. Slide a bearing plate over the opposite end of each draw rod until flush with the intermediate section port. The bearing plate ribs should be toward the nut, with flat side against the section.

NOTICE Hold the draw rods up while positioning to prevent the draw rod threads from gouging the nipple port machine surfaces.

11. Slide a washer onto each of the draw rods then thread nuts on until they are snug against the bearing plates. Make sure the bearing plates are centered on the nipple ports.



12. As additional sections are added, lay a rag in the bottoms of the nipple ports to prevent damaging the machined surfaces as the draw rods are passed through.

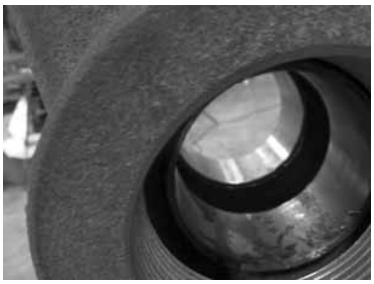
Step 16 Draw sections together using draw rods and dead blow hammer

1. Use wrenches to pull the sections together by tightening the nuts.
2. Alternate from one draw rod to the other during pull-up to avoid cocking the push nipple in its port.

3. Stike the edge of the sections with the dead blow hammer to assist in the pull up and maintain an even gap between the sections.

4. The dead blow hammer will cause a thud when struck against the section until the sections are tight together. When the draw up is complete, the dead blow hammer should cause a ringing sound from the block.
5. When the sections are properly pulled up, they will be nearly metal-to-metal.

6. Look inside the nipple ports from the end and inspect the push nipples. They should be parallel with the section face and about 1/8 inch from the inside surface of the section.



Step 17 Installation of the remaining sections

1. Follow the previous steps as applicable and install the remaining sections.

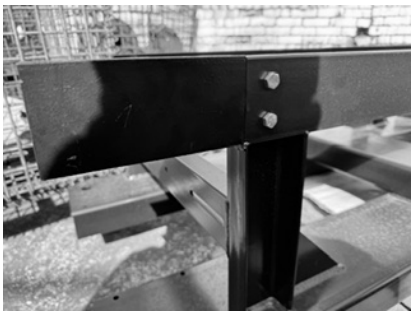
NOTICE Before attempting to install the REAR SECTION, bend down the tabs on the rear legs as shown in the photos.

2. Bend down the end tabs on the two rear base legs. This is required so that the rear section can slide into position along the runner beams. Use a hammer to bend back into position after the block assembly is complete.

Step 17 Installation of the remaining sections continued

NOTICE KN-40 boilers require the installation of base extensions as shown in the photo.

1. Bolt the base extensions onto both sides of the base as shown using the hardware provided.
2. Once the rear section is on and the tie rods are installed remove the base extension



Step 18 Remove the runner beams and bolt block to base

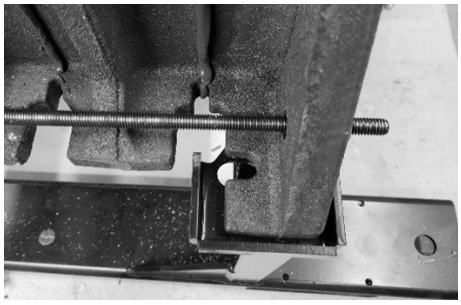
WARNING The block assembly is extremely heavy. Use care as the beams are removed to ensure the block does not slide during the process!

1. When the section assembly is completed, **leave the draw rods in place** so the section joints are secure while the block is manipulated.
2. Remove the two bolts and hardware from the bottom of the front section.

3. Use pry bars at each leg (front and back) on one side of the base. Tilt the block only enough to allow sliding the runner beam.

4. Pull the runner beam out.
5. Ease the block down so it rests on the front and rear legs.

6. Repeat the process with pry bars on the other side of the block and remove the remaining runner beam.
7. Check alignment of the section leg slots with the hole in the legs — pry section into position as needed.



8. Install the 3/8 x 4-1/2 inch bolts, wedges, washers and nuts, on all four legs (as in Step 5).

Step 19 Insert the tie rods, then tighten tie rod nuts using a torque wrench

NOTICE The tie rods **ARE NOT** used to pull the sections together — ONLY to keep them firmly in position.

1. After the block has been bolted to the four base legs, remove the draw rods, nuts washers and bearing plates.
2. When the section assembly is completed, slide a 1/2 inch tie rod through each of the four tie rod holes.

3. Apply a washer and nut on each end and pull up finger tight.

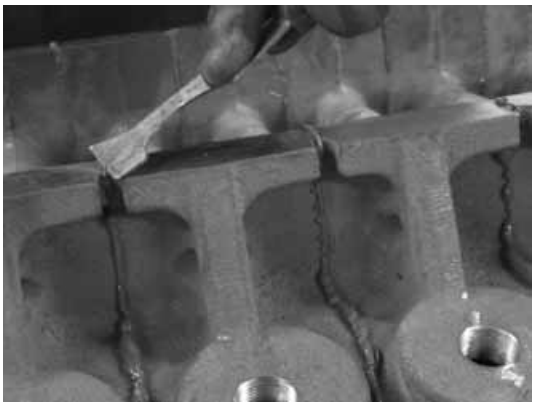
CAUTION **DO NOT exceed 30 foot pounds** when tightening the nuts. Higher torque could cause breakage of the cast iron.

4. Use a torque wrench to tighten the nuts on the tie rods.
5. Start with the upper left corner rod first and tighten the nut to 15 foot-pounds.
6. Move to the lower right rod and tighten that nut to 15 foot-pounds.
7. Repeat with the lower left, then the upper right rod, tightening both nuts to 15 foot-pounds.
8. Repeat this sequence tightening each nut to 30 foot-pounds.

Step 20 Remove excess silicone sealant along top of block and in chamber area

WARNING To prevent a flue gas leak, DO NOT pull the silicone sealant! Use a sharp tool to cut it!

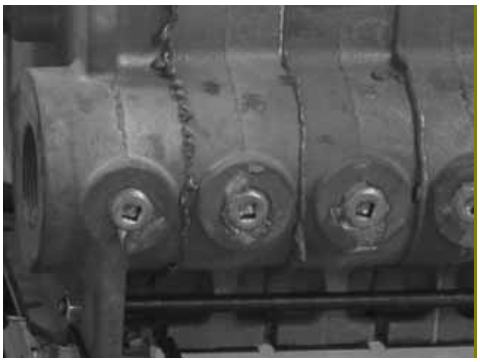
1. Remove excess silicone sealant along the top the block until it is flush with the machined surface.



2. Remove any excess silicone that may have extruded into the interior of the section assembly.
3. This area must not have any blockage where the combustion chamber will be inserted.

Step 21 Install the inspection port plugs

1. Apply the pipe dope noted on page 3 to the supplied pipe plugs, and install them in each of the inspection tappings, located at the lower right side of each section.



2. Also install pipe plugs in all top tappings except for the one in the rear section. This open tapping will be used during the hydrostatic test.

Step 22 Hydrostatically test the boiler

WARNING DO NOT exceed the test pressure specified here by more than 10 PSI!

WARNING DO NOT leave boiler unattended. Excess pressure could develop, resulting in severe personal injury or substantial property damage!

CAUTION DO NOT install any controls at this point or they may be damaged.

1. Install the 3 NPT supply and return adapters after applying pipe dope to the treads. On 4" port castings bolt the 4" supply and return adapters to the casting using the supplied gaskets and hardware.
2. Use pipe plugs and blank flanges and gaskets to seal the unused openings in the supply and return adapters.

3. Apply pipe dope to the two 3 NPT recessed plugs and install them in the front section, as shown, using the driver supplied with boiler.
4. Pipe a pressure gauge and shut-off valve to the open top tapping for bleeding air during filling and draining.
5. Remove the boiler drain valve from the return adapter.
6. Pipe a shut-off valve, water supply and drain line to the boiler drain valve tapping.
7. Plug any unused openings in the block assembly.
8. Fill the block assembly while bleeding air from top valve until it's completely filled with clean water.
9. Use a hand pump or other means to raise the water pressure in the boiler to 150 PSIG.
10. Close the valves and observe the pressure gauge for at least 10 minutes to ensure the boiler is pressure tight.
11. If the pressure drops, perform a thorough inspection to locate the leak.
12. Repair all leaks at once if possible. Contact your KN representative for instructions if necessary.
13. Once hydrostatic test is successful, drain the boiler completely.
14. Remove the temporary piping.
14. Re-install the boiler drain valve.
15. Install the boiler relief valve in the first tapping on the top rear of the boiler.

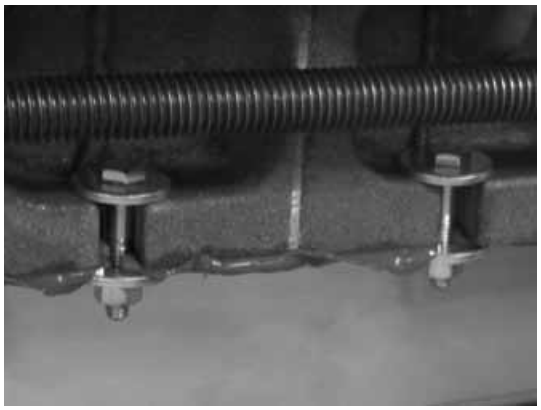
Step 23 Install condensate drain pan

WARNING The condensate drain pan must be sealed completely around all edges to prevent flue gas leakage!

1. Use the silicone RTV supplied with the boiler to apply a continuous bead on the condensate drain pan flange.
2. Guide the condensate drain pan through the front of the base as shown. This procedure requires two people to do it correctly.

NOTICE The condensate drain pan clean out cover MUST face the back of the boiler.

3. When in position, lift the pan straight up and hold it firmly against the bottom of the block assembly.
4. Install each bolt assembly as shown.
5. Tighten the nut just until the split lock washer has flattened.



Step 24 Install condensate trap assembly

WARNING The condensate drain trap must be properly installed to prevent flue gas leakage!

1. Firmly hand thread the barb fitting and screen assembly into the coupling on the bottom of the drain pan.
2. Slide the hose clamp over the condensate trap hose.

3. Push the condensate trap hose onto the barb fitting, position the hose clamp and tighen in place.
4. Mount the condensate trap to the base using the clamp and nuts provided.

Step 25 Install the combustion chamber

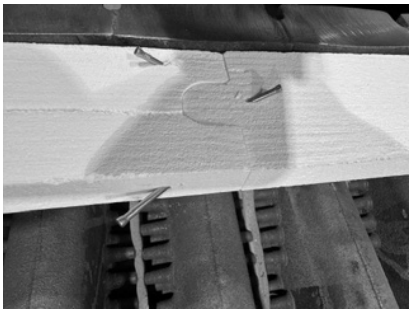
CAUTION The combustion chamber material is fragile and can be cracked or gouged with incorrect handling. HANDLE CAREFULLY! DO NOT use the chamber if it is damaged.

CAUTION Use of an approved dust respirator is strongly recommended when handling the insulating components of the boiler!

1. Remove the combustion chamber from its packaging. The KN-6 & 10 combustion chambers are one piece. The KN-16 through 30 combustion chambers are in four sections while the KN-40 combustion chamber is in six sections. The combustion chamber sections are individually packed in shipping tubes.

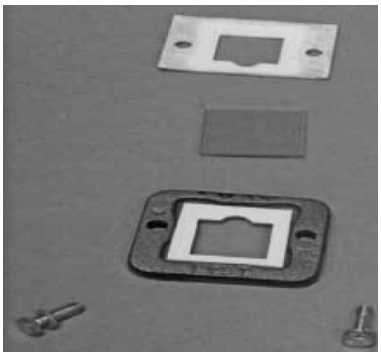
2. Carefully place the combustion chamber into the block assembly as shown.
3. The combustion chamber should sit evenly in the opening, with its FLAT surface facing up and even with the top surface of the sections.
4. Use the 1/4" ceramic rope supplied with the boiler to fill the space in the corners between the chamber and the sections to hold the chamber firmly in position and ensure a tight seal at the joints.

5. The KN-40 combustion chamber side pieces interlock in the middle and must be “pinned” using the nails provided.
6. Position the nails as shown and **push in flush** with the surface of the chamber.

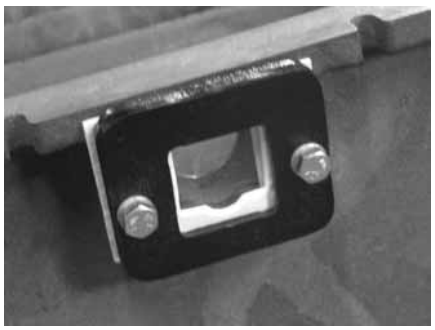


Step 26 Install front and rear burner viewports

1. Each burner viewport consists of a glass holder, inner gasket, glass and outer gasket.



2. Place the assembled viewport against the mounting boss on the top of the front and rear sections.
3. Secure with the bolts and washers provided. **DO NOT overtighten**.

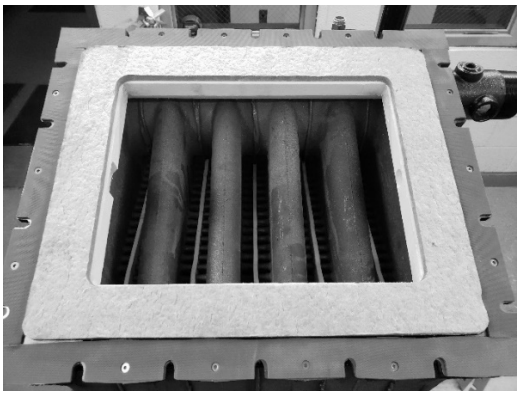


Step 27 Install the burner gasket and apply silicone sealant to top machined surface of boiler

WARNING Make sure the silicone burner gasket joints are tight and sealed. Failing to provide a complete seal could result in the leakage of combustion gases!

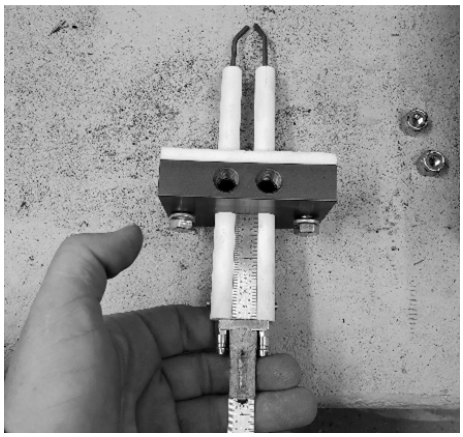
CAUTION Use of an approved dust respirator is strongly recommended when handling the insulating components of the boiler!

1. Carefully place the felt burner gasket on the surface of the combustion chamber taking care to center it. Make sure the joints in the KN-16 to 40 felt gaskets are properly interlocked.
2. Peal the backer off the silicone burner gaskets and attach them to the machined surfaces around the outside of the combustion chamber as shown. Seal the joints using a small amount of the red silicone RTV.
3. Insert the #5 stainless washers in the burner gasket holes to ensure it gets properly compressed when the upper cover is installed.



Step 28 Adjust the ignition electrodes

1. Check the electrode insertion length, measuring as shown below. If necessary, adjust it so it matches the table.



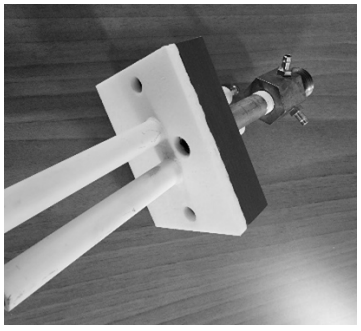
2. Make sure the electrode gap is 1/8", adjust if necessary.

Recommended Electrode Insertion Depth, ± 1/4"	
Model	*DIM "A"*
KN-40	1 1/2"
KN-30	1 1/2"
KN-26	1 1/2"
KN-20	1 1/2"
KN-16	1 3/4"
KN-10	2 1/4"
KN-6	2 1/4"

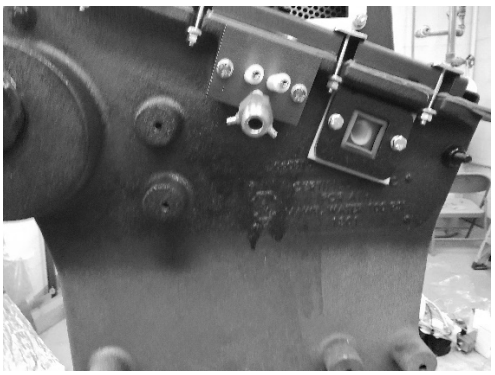
Step 29 Install the igniter assembly

WARNING Make sure the igniter gasket is properly installed. Failing to provide a complete seal can result in the leakage of combustion gases!

1. Position the gasket on the igniter assembly as shown.



2. Mount the igniter to the block assembly using the 5/16 bolts and lock washers.



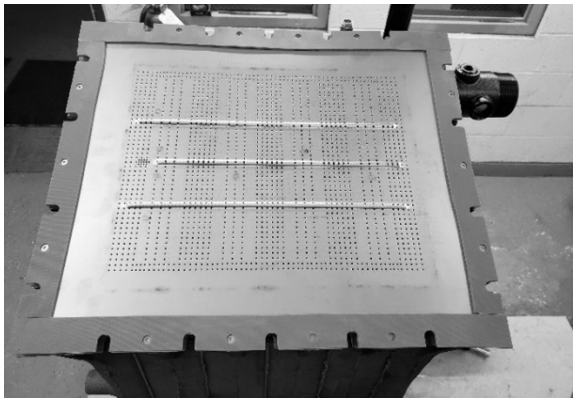
Step 30 Install the burner

WARNING Make sure the silicone burner gasket joints are tight and sealed. Failing to provide a complete seal could result in the leakage of combustion gases!

CAUTION Use of an approved dust respirator is strongly recommended when handling the insulating components of the boiler!

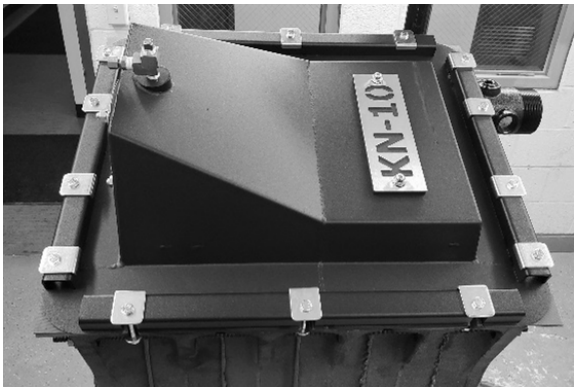
1. Peal the backer off the silicone burner gaskets and attach each piece to the burner edges as shown. Seal the joints using a small amount of the red silicone RTV.
2. Insert the #5 stainless washers in the burner gasket holes to ensure it gets properly compressed when the upper cover is installed.
3. Carefully place the burner on top of the burner gasket with the distribution plage facing up.

NOTICE The bent tabs on the burner must face down along the top edge of the block for the pilot holes in the burner to align with the pilot tube.



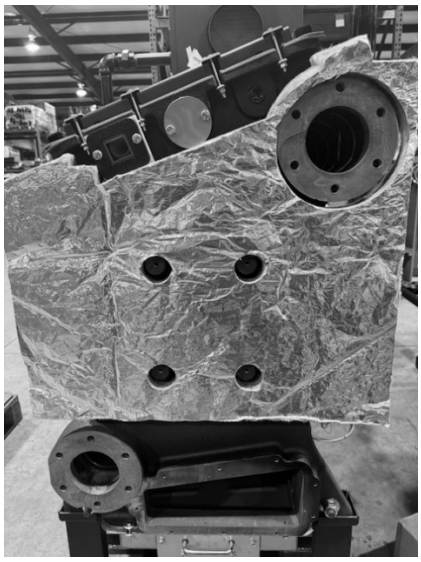
Step 31 Install the upper cover

1. Carefully align the upper cover with the blower opening toward the front of the block assembly and lower it into place.
2. Hold the upper cover securely in place while installing the retainer bolts.
3. Install bolts in all the upper cover slots.
4. Work from the center out on the sides and ends to prevent buckling.
5. If necessary, use padded clamps to pull the upper cover edges down enough to install the bolts, washers and nuts.



Step 32 Install the rear jacket panel

1. Place the rear panel insulation over threaded bosses as shown.

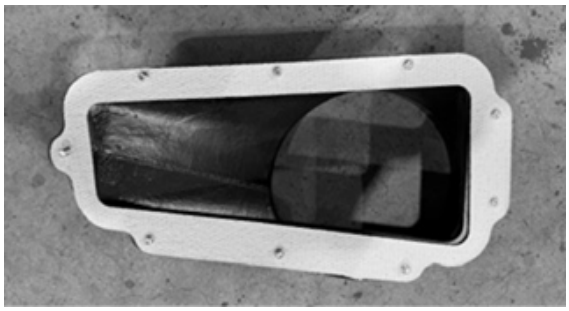


2. Hold the rear jacket panel over the bosses so the holes line up and install the four flange bolts.

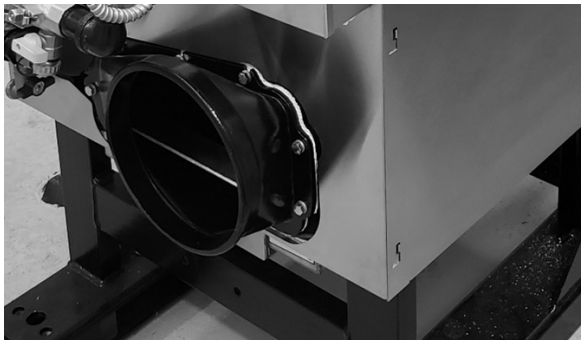
Step 33 Install the flue transition casting

WARNING Make sure the flue transition casting gasket is properly installed. Failing to provide a complete seal could result in the leakage of combustion gases!

1. Position the flue transition casting gasket on the flue transition casting.
2. Install the lock washers on the 5/16" bolts push them through the gasket as shown.



3. Line up the flue transition casting with the flue opening in the rear casting and thread the 5/16" bolts into it.
4. Tighten the bolts in a staggard pattern.

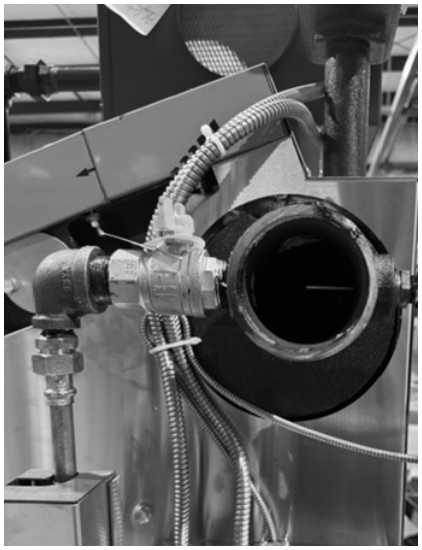


5. Install the flue adapter with the test port fitting at the top

Step 34 Install Flow Sensor and piping

1. Remove the flow sensor assembly from the packaging.

2. Connect the lower piping to the return adapter using the pipe dope, noted on page 3, on the threaded piping connections.
3. Postion the remaining piping to determine the correct length of the copper tubing and cut it to the correct length.
4. Position the ProPress adapter on the copper tubing and press in place.

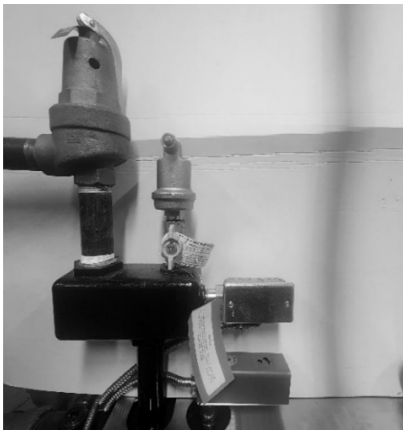


5. Assemble the remaining flow sensor piping as shown.

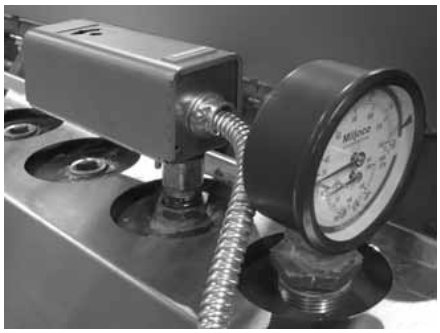
Step 35 Install top left jacket panel and control tree and trim

1. Remove the plugs from the top tapping on the front section and the last intermediate section. On KN-26 to 40 boilers also remove the plug from the first intermediate section.
2. Place the top left jacket panel over the block assembly so the top openings line up with the top tappings and engage the tabs with the slots in the jacket rear panel.

3. Install the control manifold in the rear section and populate it with the LWCO probe, air vent and releif valve as shown.
4. Install the manual reset high limit in the last intermediate section next to the control manifold.



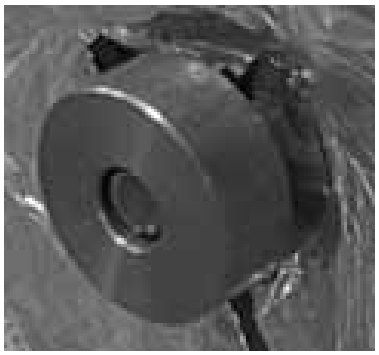
5. Install the auto high limit in the first intermediate section KN-26 to 40 boilers.
6. Install the T & P gauge in the front section.



Step 36 Install front jacket panel

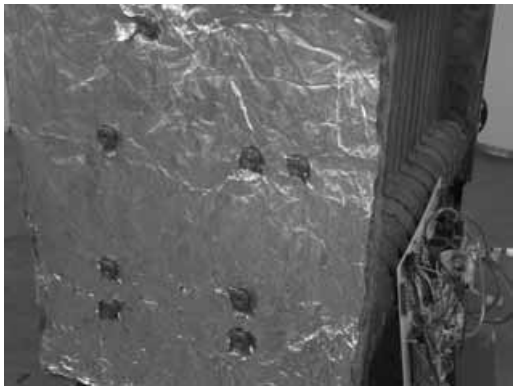
1. Insert and drive the front jacket studs into the stud bosses. There are nine studs.

2. Press the insulation onto the studs and slide a steel spacer over each stud as shown.
3. Place the spacers over the studs as shown.



4. Install the front jacket panel using washers and nuts on the three center studs.

***Step 36** Install front jacket panel continued.*



Step 37 Install the filter box

1. Place the filter box bracket over the two studs, install two flat washers and hand tighten the two nuts.
2. Remove the four hex nuts and washers from the upper cover studs.
3. Carefully lift and place the blower and filter box assembly on top of the filter box bracket while sliding the blower adapter over the upper cover studs.

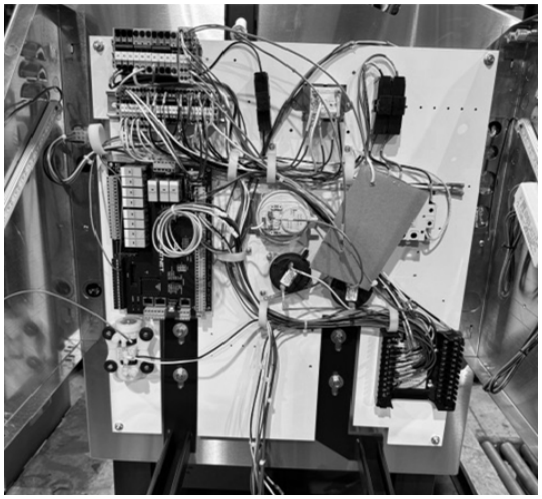
WARNING Make sure the blower adapter to upper cover gasket is in place and undamaged. Failing to provide a complete seal could result in the leakage of combustible gases!

4. Install the washers and nuts on the upper cover studs and tighten securely.
5. Place a level on the filter box and adjust the filter box bracket until the filter box is plumb.
6. Tighten the filter box bracket nuts.
7. Install the aluminum lines between the filter box and right control enclosure panel fittings.

NOTICE Once the blower has been wired install the molded blower cover.

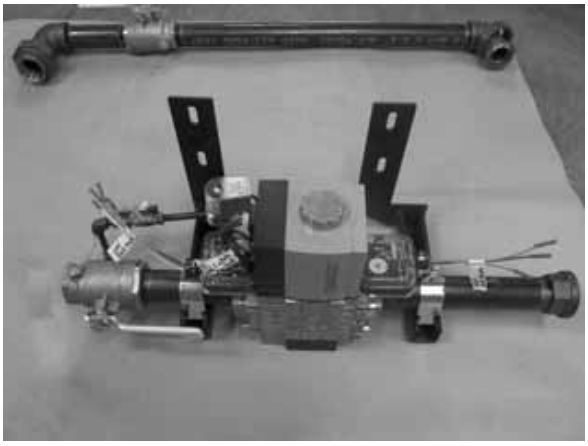
Step 38 Install the electrical panel & control enclosure side panels

1. Thread the four 1/4" standoffs into the captive nuts in the front jacket panel.
2. Place the electrical panel over the standoffs then install and tighten the four nuts.
3. Install the left and right control enclosure panels and secure with the supplied screws.
4. Clip the Molex plug on the wire harness from the rear junction box into the back of the front jacket panel.
5. Plug the mating harness into this plug and connect the wires per the wiring diagram.
6. Install the left and right jacket side panels.

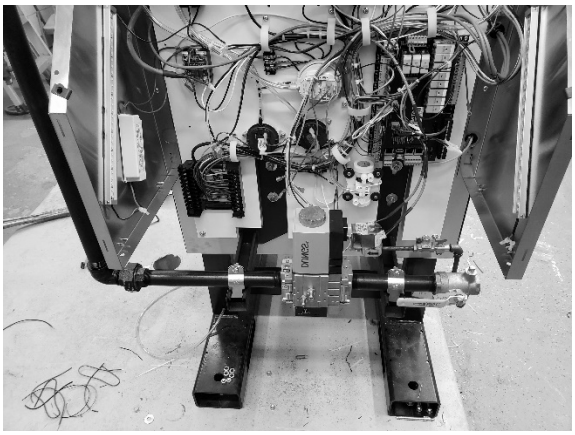


Step 39 Install the gas train

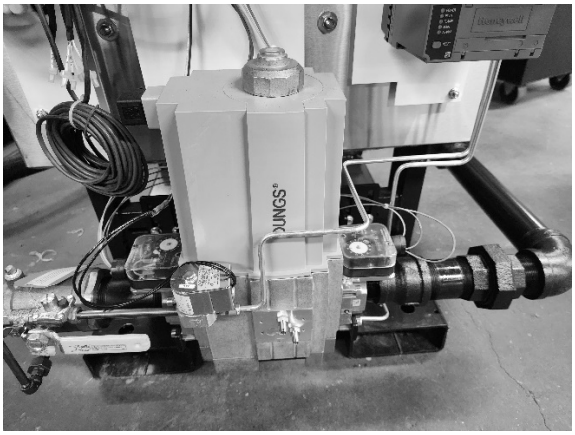
1. Locate the gas train components shown.



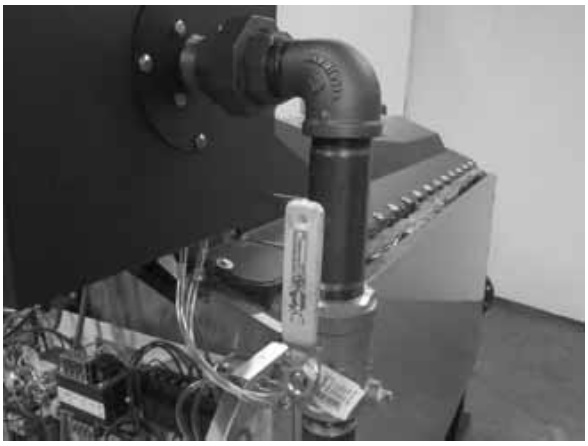
2. Place the gas train brackets over the four studs then install the flat washers and hand tighten the nuts.
3. Install the vertical gas piping and tighten in place using two pipe wrenches.



The KN-16 to 30 gas train is shown in the previous picture, with KN-40 gas train shown below.

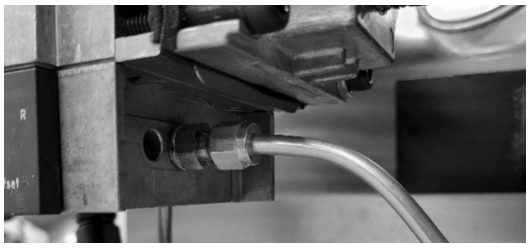


4. Adjust the gas train brackets so the gas valve is level then tighten the nuts to hold it in place.

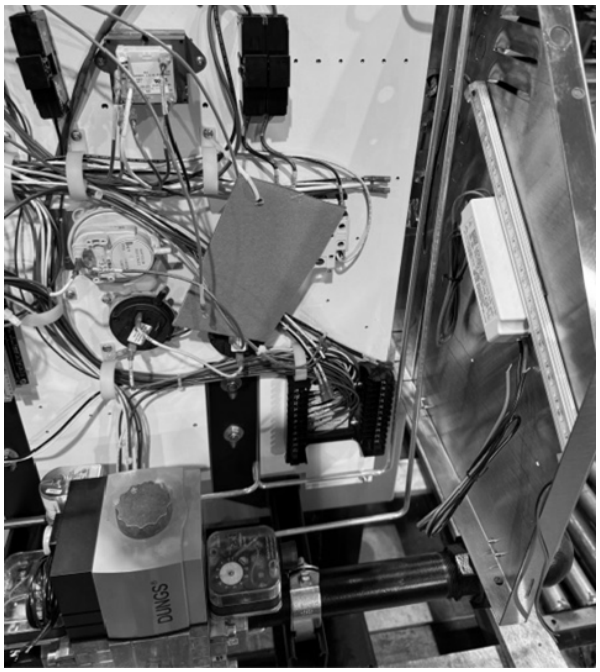


Step 39 Install the gas train continued

5. Connect the aluminum tube assembly to the pilot gas train and control enclosure fitting for the pilot valve.
6. Connect the aluminum reference line from the gas valve shown below to the control enclosure fitting for the filter box reference pressure.

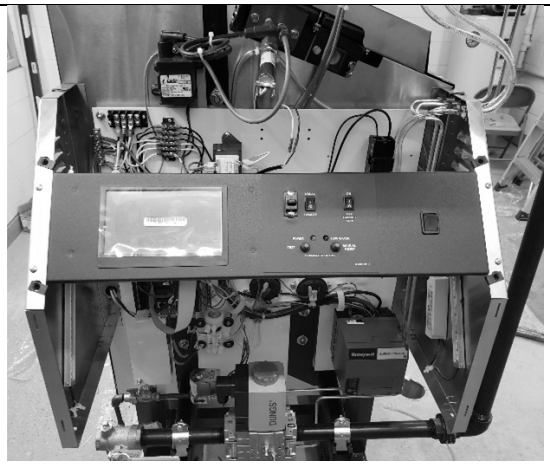


7. Refer to the Boiler Manual pressure switches section and connect the clear vinyl tubing accordingly.
8. If the gas train is equipped with gas pressure switches wire them per the wiring diagram.
9. Connect the gas valve power harness plug to the gas valve and tighten the screw to hold it in place.



Step 40 Install the touch screen hidden panel

1. Locate the touch screen hidden panel.
2. Make the necessary electrical connections and attach the panel to the control enclosure side panels with the provided screws.



Step 41 Wire connections to rear terminal box

1. Remove the cover on the rear electrical box.
2. Route the flex conduits to the electrical box openings and install the locknuts as shown. The wires are color coded so connect them so they match the wires already connected to the terminal block.
3. The harness from the rear terminal block will be attached to the control panel at the front of the boiler in Step 38.

Step 42 Follow Boiler Installation and Operating Instructions manual and HeatNet Control manual

1. Follow all instructions in both manuals listed. Pipe the boiler accordingly.
2. Wire the boiler by following the supplied wiring diagram.
2. Perform the tests indicated in the manuals.