



Fleetline

INSTRUCTIONS

FOR INSTALLATION, OPERATION AND MAINTENANCE FOR FLEETLINE RESIDENTIAL HOT WATER BOILERS

ALL INSTALLATION & SERVICE TO BE DONE BY A LICENSED AND TRAINED HEATING PROFESSIONAL

INSTALLATION

LOCATION: Locate the boiler near the chimney, but not too close to the walls. The boiler should have a minimum of 2 feet clearance from the wall on the left side or rear depending on the hot water coil location to allow proper servicing. Maintain 6" from rear or sides of boiler and a minimum of 2 feet clearance in front to allow servicing of the burner. Maintain 18" between the flue pipe and combustible material.

The installation of this boiler shall be in accordance with the most recent version of the CSA Standard B139, *Installation Code for Oil Burning Equipment*, and local regulations.

The boiler should be provided with adequate fresh air for combustion and ventilation. An opening at least twice the area of the smoke pipe is necessary.

The boiler shall be connected to a flue having sufficient draft at all times to assure safe and proper operation of the unit.

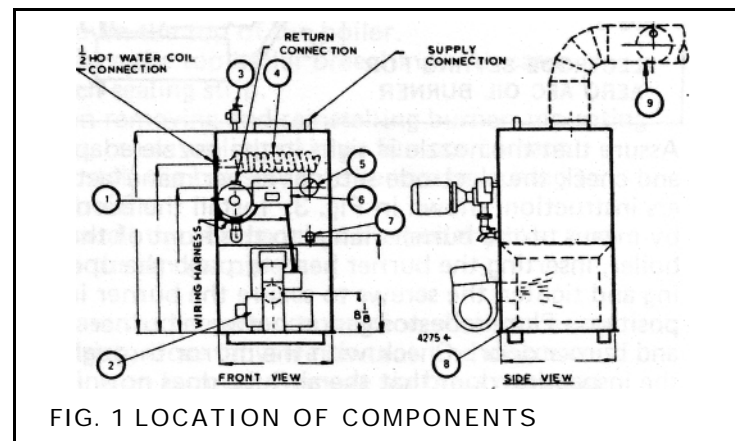
The boiler must be installed on a noncombustible level floor or base.

OIL PIPING:

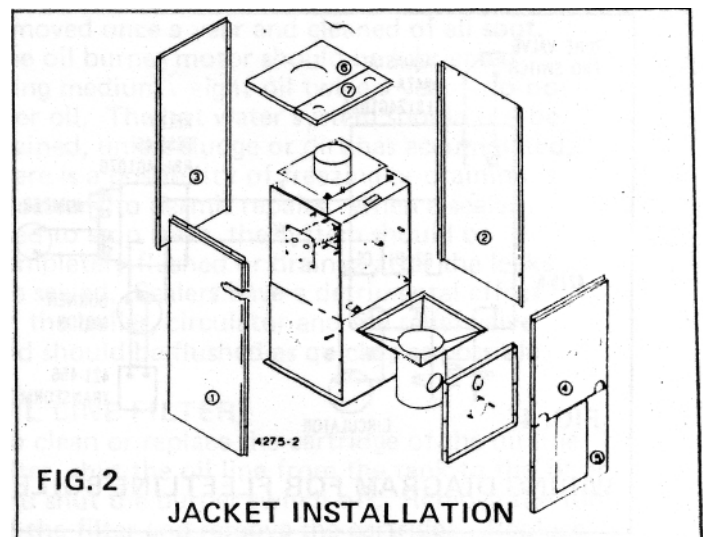
All piping shall be approved copper tubing, with U. L. listed fittings. At least 3/8" O.D. Copper tubing, having a wall thickness of not less than .049" shall be used in connecting the burner to the tank. The piping shall be protected from possible injury and shall be rigidly fastened in place. It should be buried underground, or in a concrete floor, or placed in a metal-covered pipe trench. Do not cover the piping until the burner has been installed and operated so that any leaks may be detected and corrected. All pipe joints shall be tight and pipe thread compound resistant to oil should be used. Avoid kinks, sharp bends and changes in direction in the oil suction line. To minimize the possibility of air leaks, tighten packing gland at the shut off valve and be sure to tighten the cover at the oil filter, as filter gaskets often shrink.

HEATING SYSTEM PIPING:

To install the circulator pump, attach close nipple to boiler at lower left, then the elbow, and another nipple. Mount circulator flange on nipple and assemble circulator to flange. Connect return line directly to circulator. A 3/4" pipe should be installed (do not use smaller than 3/4" pipe) on the outlet of the safety valve and terminated within 6" of the drain.



- | | |
|--------------------|-------------------------------|
| 1. Circulator | 2. Burner |
| 3. Relief valve | 4. Tankless Heater (optional) |
| 5. Tridicator | 6. Aquastat control |
| 7. Drain | 8. Combustion chamber |
| 9. Draft regulator | 10. Wiring Harness |



(FLEETLINE RESIDENTIAL HOT WATER BOILERS)

Jacket Installation:

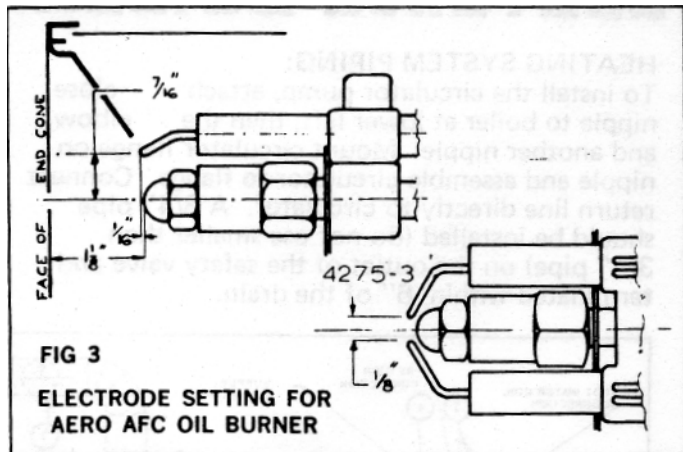
The jacket assembly is supplied in 7 sections and should be assembled as shown in the illustration in Fig. 2.

Pre-assemble Left Side 1 Right Side 2 and Back 3 before putting panels on boiler and secure with sheet metal screws.

Slip the pre-assembly on from back of boiler, attach Upper Front 4 and Lower Front 5 then 6 Top Rear and 7 Top Front then screwing it all together with sheet metal screws.

OIL BURNER

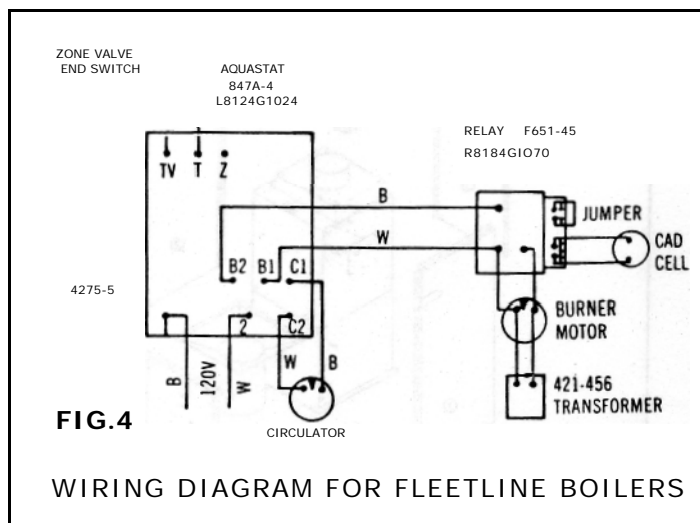
Aero as per CSA label on boiler and listed below.



Assure that the nozzle is tight in the nozzle adaptor and check the electrode settings as per manufacturer's instruction, shown in Fig. 3. Install the burner by means of the burner flange to the front of the boiler, inserting the burner head through the opening and tighten the screws to secure the burner in position. Place burner gasket between burner and burner door. Check, with a mirror through the inspection door, that the air tube does not extend past the inside of the combustion chamber.

WIRING

All wiring must comply with local codes and ordinances regarding wire size, type of insulation, enclosures, etc.



OPERATION

"READ AND SAVE THESE INSTRUCTIONS FOR REFERENCE" These instructions cover all our F series boilers.

STARTING:

Before filling the boiler with water, be certain that the firing equipment is in operating condition. Do not light the fire.

Oil and grease which accumulate in new boilers can be washed out as follows: Add trisodium phosphate or caustic soda at a rate of 1 pound of either chemical per 50 gallons to the boiler water system. As caustic soda is extremely corrosive to the skin and clothing - DO NOT ALLOW THE DRY MATERIAL NOR THE CONCENTRATED SOLUTION TO COME INTO CONTACT WITH YOUR SKIN OR CLOTHING. Use No. 2 furnace oil only. "DO NOT USE GASOLINE, CRANKCASE DRAINING OR ANY OIL CONTAINING GASOLINE."

Fill the entire system with water before start to firing the equipment.

Circulate the water through the system and vent the system including the radiators. Bring boiler water to operating temperature and circulate the system for a few hours.

Stop burner and drain the water to a safe place.

Thereafter wash the water side of the boiler thoroughly using a pressure hose and refill the system with fresh water. Heat the water to at least 180° F immediately in order to drive off the dissolved gases which can corrode the boiler. Tighten all plugs while the boiler is hot. The boiler is now ready for service.

Check all radiators, starting with the lowest one, for entrapped air. Open air vent and bleed air until water begins to flow. Bleed air from all radiators on higher floors. If your radiators are equipped with automatic air vents, no manual bleeding is necessary, except to speed up the initial filling of the system.

THE SAFETY RELIEF VALVE OF THE BOILER SHOULD BE CHECKED MONTHLY BY MOMENTARILY PULLING THE LEVER AND OBSERVING THE FREE FLOW OF HOT WATER.

Pipe off to a safe place the escape from the Relief Valve, the Drain Valve and Low Water Cut-offs.

THE MAXIMUM WATER WORKING PRESSURE IS 30 PSI.

TANKLESS COIL

To obtain adequate temperature for hot water, the boiler water must be kept at a high temperature 180° F to 190° F is the normal setting for the low limit, a differential of 10-15° F and a high limit at least 20°F above the low limit.

STARTING THE BURNER

"DO NOT ATTEMPT TO START THE BURNER WHEN EXCESS OIL HAS ACCUMULATED, WHEN THE UNIT IS FULL OF VAPOUR, OR WHEN THE COMBUSTION CHAMBER IS VERY HOT."

The boiler should not be started unless the cleanout door is in place and the combustion chamber is free of oil or vapor.

To start proceed as follows:
Push red reset (safety) lever and release.
Open valve in oil supply line.
Check that all indicators are at proper settings.
Adjust thermostat to call for heat. Close line switch to start burner.
The burner will operate until line switch is opened or the control settings are reached.

Check operation of High Limit Control by turning it manually to ensure that it is in operation and shuts off the burner.

NEVER BURN GARBAGE OR PAPER IN THE UNIT AND NEVER LEAVE COMBUSTIBLE MATERIAL AROUND IT.

Follow burner manufacturer's instructions and recommendations for starting the burner.

ALWAYS KEEP THE MANUAL FUEL SUPPLY VALVE SHUT OFF IF THE BURNER IS SHUT DOWN FOR AN EXTENDED PERIOD OF TIME.

OPERATING ADJUSTMENTS

BURNER

To obtain optimum efficiency and performance from the burner, adjust the burner air band adjustment alternately with the draft regulator until not more than a No. 1 smoke spot is obtained. This should be obtained with a minus .02 inches W.C. draft over the fire. Instruments should be used for adjustment of the burner. Boiler will operate in excess of 80% efficiency if burner is properly adjusted.

DRAFT REGULATOR

The front weight should be turned outward (counterclockwise) for less draft and inward (clockwise) for more draft. The front and rear weights move together. After the weights have been set, the hexagon locknut should be tightened to prevent movement. A draft gauge should be used to establish the proper settings. The draft control is designed to obtain .02" to .06" W.C. settings.

MAINTENANCE

GENERAL

The flues of the boiler should be kept clean as soot does not conduct heat and a dirty boiler will require more oil to heat than a clean boiler.

CLEANING INSTRUCTIONS

WARNING

DO NOT PUSH CLEANING BRUSH MORE THAN THE LENGTH OF THE BOILER TUBES (APPROX. 3" LONGER THAN ST. ST. BAFFLE) OR THE FIRE BOX WILL BE DAMAGED.

To clean the boiler start by removing the smoke pipe from the boiler breeching collar. Remove the two sheet metal screws holding the top panel casing of the boiler jacket (See Fig. 2)

Remove the four brass nuts from the boiler breeching and then remove the flue gas baffles from the boiler tubes.

Brush the tubes with a 1 3/4" tube brush. Vacuum the top of the boiler. Replace the top boiler breeching with care, Watch sealing strip.

When removing and reinstalling burner, mounting plate, re-use sealing strip or furnace cement. Reinstall the brass nuts to secure breeching to the boiler. Reinstall the top panel of the boiler jacket and then the smoke pipe.

In case the ceramic combustion chamber needs cleaning, close oil valve on tank and disconnect oil line on burner. Remove six brass nuts and bolts, holding the burner door, and remove door. This will enable you to remove the combustion chamber to the front. "HANDLE WITH CARE"

BOILER

As boilers can corrode on the fireside these surfaces should be thoroughly cleaned at the end of the season. The flue pipe should be removed once a year and cleaned of all soot. The oil burner motor should be lubricated using medium weight oil twice a year -do not over oil. The hot water system should not be drained, unless sludge or dirt has accumulated, there is a possibility of freezing or draining is necessary to permit repairs. When a sealer is used to stop leaks, the system should be completely flushed or drained after the leaks are sealed. Sealers have a detrimental effect on the boiler, circulator and the relief valve and should be flushed as quickly as possible.

OIL LINE FILTER:

To clean or replace the cartridge of the oil line filter, shut the oil line from the tank to the filter and shut the burner switch off. Remove the top of the filter and remove the cartridge. Replace

with a new cartridge. When changing filter, the oil pump on the burner should be bled to remove any air that could have entered the system.

HOT WATER COIL

The hot water coil should be backwashed periodically using valves to reverse the flow through the coil. This backwashing will reduce the scale accumulation of the outlet side of the

heater coil. The frequency of backwashing should be established by experience.

When the coil becomes restricted by the minerals it will require replacement. To replace the coil, shut off the water supply and drain the system. Disconnect the piping connections to the coil and remove the panel by removing the screws. The water coil can be removed by loosening the hexagon nuts from the studs as shown on Fig. 2.

WARNING

Our equipment is designed for normal operating conditions in accordance with the specifications and is CSA certified. If operated beyond the conditions specified, the equipment can be damaged, for which we cannot be held responsible.

DO NOT TAMPER WITH THE UNIT OR CONTROLS.

**SAVE THESE INSTRUCTIONS FOR
FUTURE REFERENCE.**

**Install, operate and maintain this equipment in
accordance with the instructions provided.**

**Instructions for blow down of boiler: TURN OFF POWER SUPPLY
IMMEDIATELY, AS WELL AS FUEL VALVE AND CALL SERVICE MAN.**

FOR EMERGENCY, CALL 24 HOUR SERVICE CENTRE:

INSTALLERS EMERGENCY PHONE NO.



***fleetline* RESIDENTIAL HOT WATER BOILERS**

Manufactured By:
Brant Steel Products Limited 49 Craig Street Brantford Ontario N3R 7H8



CERTIFIED



fleetline

Boilers

A. ONE YEAR WARRANTY

Fleet-Line Boilers (Brant Steel Products Limited) hereby warrants to the owner at the original installation address that the heating appliance registered by this certificate is free from defects in material and workmanship. Brant Steel Product's obligation under the terms of this warranty shall be limited to repairing or replacing, at its option, free of charge, f.o.b. Brantford, Ontario, any part or parts of the appliance which, in its sole judgement show evidence of factory defect; and providing further, that the said part or parts be returned at the owner's expense to Brant Steel Product's plant at Brantford, Ontario, if required by Brant Steel Products, within one year from the date of original installation and that proper field installation has been made by an experienced and qualified heating mechanic

B. FOUR YEAR WARRANTY (second through fifth year inclusive)

In addition to the one year warranty specified above, Brant Steel Products warrants that it will, at its option, either repair or supply a replacement heat exchanger free of charge, f.o.b., Brantford, Ontario, in the event that the heat exchanger portion of the appliance cracks or breaks during the first five years after date of installation, provided that the boiler has been installed and operated with a triple aquastat to maintain proper temperatures. In addition to this, proof of annual service and inspection by licensed and qualified heating professional must be available.

C. FIFTEEN YEAR ADDITIONAL WARRANTY (sixth through twentieth year inclusive)

In addition to the one year and four year warranties and conditions specified above, Brant Steel Products further warrants that if the heat exchanger cracks, breaks or leaks at any time from the beginning of the sixth year following date of original installation up to and including the 20th year, it will furnish a replacement heat exchanger only at list price less the percentage indicated below for the year in which failure might occur. (The term "list price" shall be here understood to mean the list price currently in effect in the year in which such failure does occur).

WARRANTY

TWENTY YEAR PROTECTION PLAN

The warranties set forth in paragraphs A, B and C above shall apply only when the appliance is used for the specific purpose for which it is intended and under conditions within its specified limits. It does not apply to boiler ruptures caused by freezing, insufficient water, excessive pressure or leaks at water connections. Brant Steel Products does not assume responsibility for damage or malfunctioning caused by rust or corrosion, sandy or discoloured water, nor is any warranty given herewith applicable to external or internal water heaters.

These warranties further apply only if the following conditions have been met severally and collectively:

1. The appliance has been installed and operated in accordance with the practices and procedures recommended by various trade and technical organizations, including but not necessarily limited to C.M.H.C., Institute of Boilers and Radiator Manufacturers, and provided further that all applicable local ordinances and codes have been complied with.

2. The appliance has been operated with the particular fuel for which it is designed and equipped, at an input rate not in excess of the rating shown on the rating plate attached to it.

3. The appliance has not been allowed to operate without the proper automatic operating and limit controls (and adequate expansion tank properly maintained, where applicable; and properly sized relief valve).

4. The heat exchanger has not failed as a result of the failure of another component, control or component parts.

5. The appliance/boiler is not exposed to continuous thermal shock, or operated below 135°F boiler return water temperature. In homes with large cast iron radiators and large water content, a mixing valve or pipe-by-pass has to be installed, in order to enable the boiler water to reach 180°F. The return water shall not drop more than 20°F.

6. Satisfactory evidence of the absences of damage or malfunctions has been filed with Brant Steel Products together with proof of failure under the terms of this warranty, not more than thirty days after such failure has occurred.

7. The appliance has been installed as part of a hot water heating system.

8. The defective part or parts are returned only upon written authorization from Brant Steel Products, transportation charges prepaid (except that Brant Steel Products may, at its option, appoint a qualified representative to make a field inspection of the unit at the place of original installation to determine the extent of failure).

Replacement of the appliance or parts as specified above will be the full extent of Brant Steel Products responsibility. Transportation costs, damages, direct or consequential, loss of profit or good will, repairs and labour costs incurred in conjunction with failure, removal and reinstallation, shall be at the owner's expense. No other warranty, either expressed or implied, is authorized by Brant Steel Products, and no representative of Brant Steel Products has any authority to amend warranty terms in any way whatsoever.

NOTE: THIS WARRANTY NOT VALID
UNLESS REGISTERED -- to register, please complete the information requested below upon the attached copy and return at once to Brant Steel Products.

REPLACEMENT COST SCHEDULE

owner pays current list price less:

1st through 6th year	100%
6th year	50%
7th year	40%
8th year	30%
9th year	20%
10th - 20th year	10%

----- Detach Here and Return -----

FLEETLINE RESIDENTIAL BOILER WARRANTY AND REGISTRATION

****TO BE COMPLETED BY INSTALLER****

ADDRESS OF INSTALLATION _____

NAME OF OWNER _____

DATE OF INSTALLATION _____ INSTALLED BY _____

PURCHASED FROM AND INVOICE NO. AND DATE _____

MODEL NO. _____ SERIAL # _____ FIRING RATE _____

RETURN COMPLETED WARRANTY REGISTRATION TO

Brant Steel Products Limited
49 Craig St. Brantford, Ontario
N3R 7H8

OIL BURNER CERTIFICATE

AS REQUIRED BY CANADAIN STANDARDS ASSOCIATION
INSTALLATION CODE FOR OIL BURNING EQUIPMENT NUMBER B 139.

The Make _____ Model No _____ Serial No _____ installed at _____
_____ bears a label evidencing compliance with Canadian Standards Association.
(Address of Installation)

Installation Code for Oil Burning Equipment Number B 139 has been installed in accordance with the instructions in the manufacturer's installation manual and in conformity with local regulations, codes, and ordinances.

All necessary permits have been secured, and the installation has been tested in accordance with the test procedure of Canadian Standards

CO2 At Breeching _____ Net Stack Temperature at Breeching _____

Water Temperature in Boiler _____ Draft Over Fire _____ Inches water column _____

Firing Rate _____ gals./hr. _____

All controls and limiting devices have been checked for proper operation _____

Fuel used, Grade No _____ per CSA - B 140.0 General Requirements for Oil Burning Equipment.

Field service equipment smoke scale reading _____

The above test results are certified to be true: _____

For service call: _____

Important Information

Do not allow the fuel tank to run out of oil. During the summer be sure that your fuel tank is kept full; this will prevent condensation of moisture on the inside surfaces of the tank.

Combustion Air Supply

Your burner requires a generous amount of clean combustion air in order to burn the fuel completely. Lack of adequate combustion air may result in erratic operation of the burner or noisy combustion or fuel odours in the air. Remember your need for outside air will be greatly increased if you have a vented dryer in the basement or other venting fans in the home.

Oiling the Motor

Motor life will be increased by proper oiling. Use a few drops of nondetergent oil at both motor oil holes twice a year.

Filter

The line filter cartridge should be replaced every year to avoid contamination of the fuel unit and atomizing nozzle.

Area around Heating Unit

Should be kept clean and free of any combustible materials - especially papers and oily rags.

Never

Burn garbage or refuse in your heating unit. Never try to ignite oil by tossing burning papers or other material into your heater.

Service Information

"Preventive Maintenance" is the best way to avoid unnecessary expense and inconvenience. Have your heating system and burner inspected at regular intervals by a qualified service man. If difficulty occurs, follow these simple checks before calling the service man.

1. Be sure there is oil in the tank and valve is open.
2. Be sure the thermostat is set above Room Temperature.
3. Be sure main Line Switch is "ON" and fuses are not blown.
4. Reset Safety Switch of Burner Primary Control (once only). If unit does not start call Service Man.
5. Press Thermal Protector Button of Burner Motor.
6. If installation is equipped with Manual Reset Limit Control... Press Reset Button.
7. If burner runs but there is no flame, fuel unit may be airbound. Follow instructions for venting fuel unit.

The Following Information Is Important in Servicing the Burner

1. Burner Components: If replacement of burner parts is necessary, always use parts recommended by the manufacturer. specify part number and description when ordering.
2. Nozzles: Use of the correct atomizing nozzle is very important. If replacement is necessary, use the same type supplied by the manufacturer. Nozzle capacity and type are stamped on the hexportion of the nozzle body. Use extreme care in handling nozzles to avoid scratches or dirt that could cause leaks or affect the oil spray pattern.
3. Electrode Setting is most important for reliable ignition of the oil. Check to be sure setting is in accordance with Instructions provided in this manual.
4. Fan and blower housing should be kept clean of dirt and lint. If heating unit is located near unvented dryer, special care must be taken that lint does not **restrict air passages in burner.**

BRANT STEEL PRODUCTS LTD. URGES ALL INSTALLERS OF
DOMESTIC HEATING BOILERS TO PREVENT

Thermal shock.

by John A. McAuley, Jr.

It truly amazes me that the boiler industry still has thermal shock problems! I have written several articles on the subject through the years. The American Boiler Manufacturers Association has publicly warned of the dangers of thermal shock. Yet, year after year, I come in contact with it.

Why? My idea is that the boiler manufacturer produces a boiler which is competitive and acceptable to the market, and then they sell it to the contractor. After all they've been selling the same boiler for fifty years, why redesign it now?

The contractor has bid a specified job, which was designed by a Professional Engineer. The P.E. approves the equipment so the contractor is off the hook. The boiler the contractor has submitted is either the least expensive he could find or old Joe (the boiler salesman), is an old friend and he's been installing Joe's boiler for years.

The engineer most likely doesn't even really know what thermal shock is. He is designing a complete mechanical system. He has to size boilers, chillers, pumps, piping, ducts, and design a control system. They are expected to know everything, many think they do, however in reality no human is perfect and knows all. There is just too much to know in the mechanical business.

The person selling the boiler is a manufacturer's representative. He represents one boiler manufacturer and believes his boiler will perform wonders. To him, it is undoubtedly the best piece of equip-

ment for every job. He is paid a commission and has a quota to fill, filling this quota becomes his main concern. Many times he is a salesman first and a technical person last.

Last, but not least, comes the customer! Everyone he is dealing with has an excellent reputation: The job looks beautiful to him when it is completed. Within a few years, however, the boiler starts to crack, usually in the spring or fall. Everyone has been paid and they are all off on other jobs by now. The customer is naturally irate, so in come the attorneys.

Who's fault is it? Everyone, except the customer!

I can understand something which is new and strange happening. Sometimes we have a problem with a system which is due to something weird, which no one has seen before.

That is not the case with thermal shock. If there is a contractor, manufacturer, sales representative, or engineer who says he has never come in contact with thermal shock, I would question his credentials.

We come in contact with at least six thermal shock problems a year in the Washington, D.C. area alone. We have never failed to remedy the cause of the thermal shock and leave the customer operating properly.

One particular problem I remember was a boiler which was piped in backwards for over twenty years! This customer had replaced tubes on a monthly basis for over twenty years! I cannot believe that all of the other people

By reading this article you will understand our concern. In a previous mailing, this message may have been unclear. Please contact Mr. Mark Offenhammer if you have any further questions.

Phone (519) 756-5700

Fax (519) 756-1742

E-mail : fabricate@brantsteel.com

Web www.brantsteel.com

who had been in the boiler room during this twenty year period didn't investigate the problem. (Maybe they just didn't know what to look for. I hope that is the answer versus they didn't care.)

We are all individuals serving the customer in our various trades, or professions. However we have a group obligation to give that customer a quality job. I cannot believe that so many people can be lacking the pride in their profession which should be the top priority.

Thermal shock is a very simple problem. It occurs mostly on hot water steel boilers; however, steam boilers may be shocked also. The following are the visible signs of a possible thermal shock problem:

1. Cracked furnace tube, usually in the rear
2. Cracked tube sheet, again the rear one
3. Cracked tubes where they meet the rear tube sheet
4. Weeping water around the tubes where they are rolled into the rear tube sheet
5. Continuous mud leg stay bolt leaks

A boiler is no more than a big piece of steel. If it has proper water treatment, and is operated properly, it should last almost forever.

The boiler tubes should be good for twenty years.

Periodic leaking means something is wrong and should be investigated. It is usually not the boiler that has the problem; rather it is something external which causes the boiler to leak. The two major and most common causes of

thermal shock are: rapid entering of cold water into the boiler or overfiring a cold boiler.

The signs of thermal shock normally show up on the hottest part of the boiler. In the case of a scotch marine type, it will be at the rear where the hot gases make their turn from the furnace tube into the first row of tubes. In a water tube boiler, it will be on the lower half of the boiler on the combustion chamber tubes. In a brickset, firetube type it will normally be the staybolts in the mud legs, or the mud leg inside corners.

In a steam boiler thermal shock will normally occur in two ways-firing a cold boiler in high-fire or the condensate returning to the bottom rear of the boiler too cold. However, the incidences of thermal shock in steam boilers are not many.

In hot water boilers, the greatest cause, by far, is the three-way, system temperature control valve. In the spring and fall, our system may have water as low as 100 degrees in it. Boilers operate at 180 degrees, as an average. When system temperature starts to drop, the three-way mixing valve opens up to allow 180 degree boiler water into the loop to bring up the temperature. This 180 degree boiler water is replaced with 100 degree system water. It is like a glass being taken out of a hot dishwasher, and placing an ice cub in it-it cracks.

How do we prevent this from happening? There are two methods.

The first is to install a blend pump, sized large enough to bring the return water up from 100 degrees to no less than 40 degrees lower than the operating temperature. This pump must be sized for the worst case scenario and be piped between the boiler supply and return. The further away from the boiler inlet that you can tie in the line the better; this will give you more time to mix the water before it enters the boiler.

The second method would be to install a probe near the boiler inlet, in the path of the incoming water. This control would act as a limiter and protect the boiler from sudden rushes of cold water. When the temperature we are sensing drops more than 40 degrees below operating temperature, we would close the three-way valve from taking boiler water regardless of the loop temperature. This may cause a slight delay in bringing up the loop temperature but the boiler will not be damaged.

Honeywell manufactures a four-way valve, through its Central line which is designed with a probe in the boiler for exactly this purpose. This system is very successful if installed properly.

Why don't control manufacturers concern themselves with this problem? They design the temperature control system only-the boiler isn't their problem. Why don't the boiler manufacturers concern themselves with the problem? Their boiler will operate fine if there is a twenty degree system drop and the boiler is operated at 180 degrees.

The problem is that in today's market everyone is concerned with energy conservation and building temperature control. Every new building has a temperature control system which resets system temperature based on outside temperature and occupancy.

Why should a boiler be designed to operate as they did twenty years ago? Why shouldn't the control manufacturer be concerned with damage to the boiler, isn't it part of the system?

The problem of firing a cold boiler at maximum input is easily remedied. Install a low-fire hold control on every boiler, not as a customer option. This is no more than an aquastat that holds the boiler in low-fire until a certain water temperature is reached. Then it will allow our automatic controls to take over and the boiler will go to *high-fire*. If the boiler goes down in the middle of the winter, it will, of course, take a little longer to bring the system up to temperature, but the boiler won't be damaged.

On smaller applications on/off pump operations are the worst enemy. If we install a time clock, or outdoor reset, on a pump alone, we are doing no favors for the customer. When the pump has been off for any period of time, and it cycles on, we will dump cold water into the boiler. The boiler has to get shocked!

Some boiler manufacturers return the water to the bottom rear of the boiler. We should always return to the top of the boiler, and hopefully flow to the front first. The front of the boiler is the coolest as far as the fireside gases go. The top also has more space in *which* to mix the water before it hits the tubes and tube sheets.

It seems that some manufacturers are so tuned into steam boilers that they cannot simply reverse the inlet and outlet for a hot water boiler. Most manufacturers do reverse the tappings for hot water boilers, but there are still some that do not.

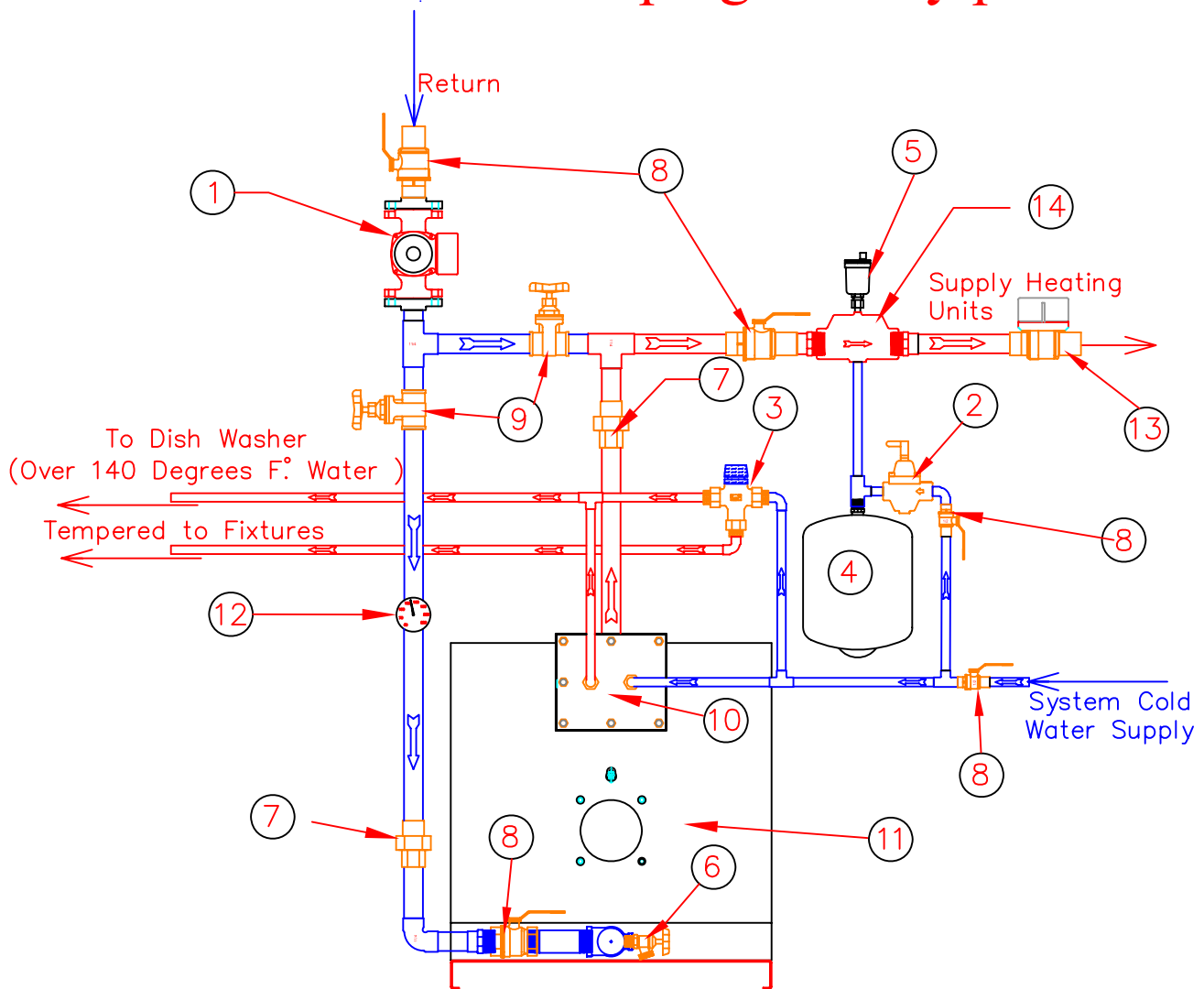
I sincerely hope that the day will come when this problem is realized by all parties involved and that we take better care, as a group, to give our customers what they deserve-a good quality job that will last for years, relatively maintenance free.



BRANT STEEL
PRODUCTS LTD.

49 Craig Street, Brantford, Ontario N3R 7H8 519.756.5700 Fax: 519.756.1742 fabricate@brantsteel.com www.brantsteel.com

Fleetline Boiler Piping with by pass



- | | |
|----------------------------------|-------------------------------------------------|
| 1. Circulating Pump | 7. Union |
| 2. System Fill Valve (12-15 PSI) | 8. Ball Valve |
| 3. Thermostatic Mixing Valve | 9. Gate Valve |
| 4. Expansion Tank | 10. Instantaneous Water Heater / Domestic Coil |
| 5. Vent Valve | 11. Heat Generation Source (Fleetline Boiler) |
| 6. Boiler Drain Valve | 12. Return Water Temperature Gauge |
| | 13. Zone Valve |
| | 14. Air Trap |

PRODUCTS - Fleetline Hot Water Boilers, Bakery Ovens & Proofers, Heat E Exchangers, eKOCOMFORT Products.

SERVICES - Product Development, Custom Fabrication & General Machining, Bakery E Equipment Service.

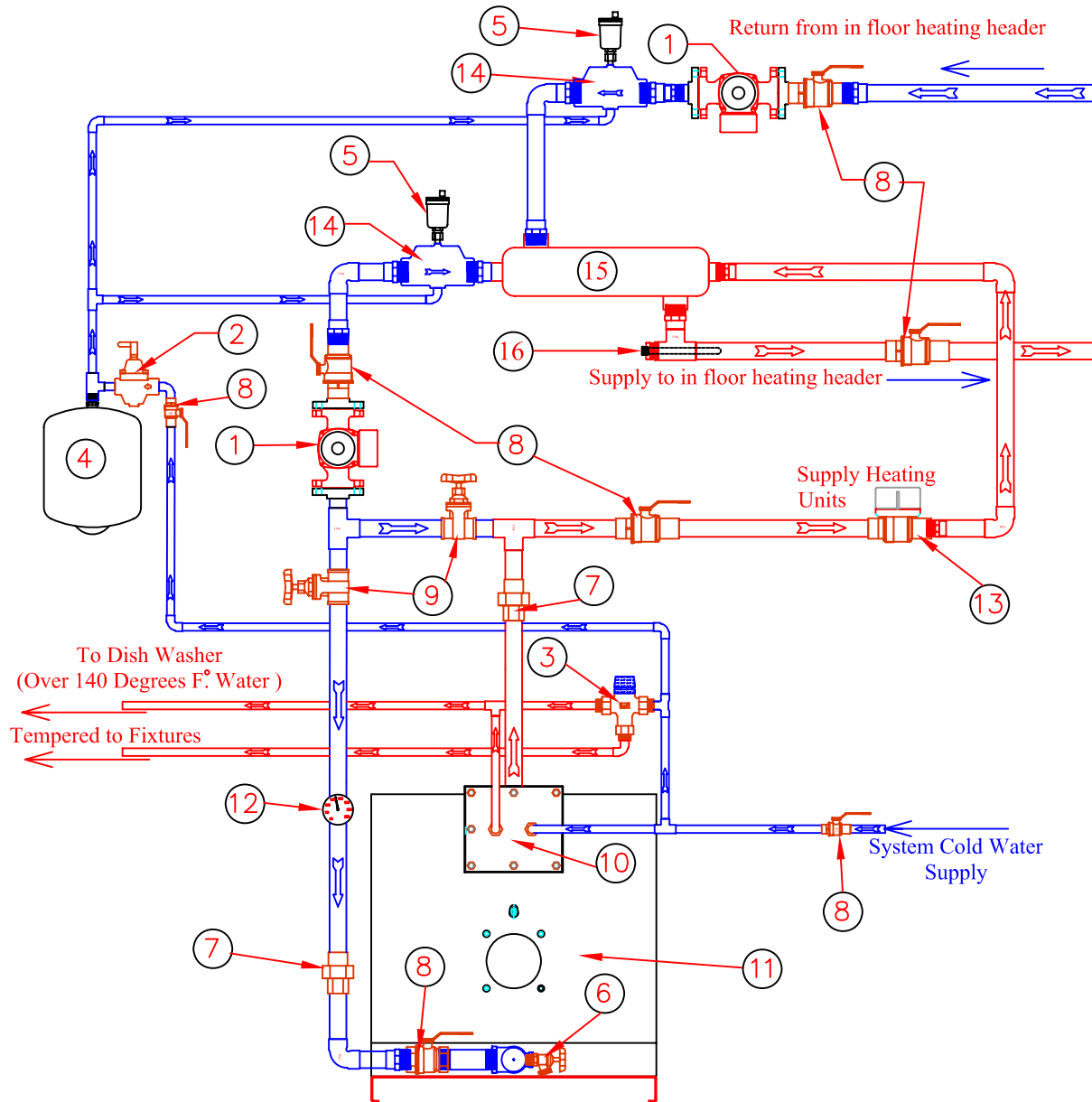
CUSTOM FABRICATION - Forming, Rolling (to 10ft.), Shearing, Flame and Plasma Cutting, Metal Stamping (200 t ton) and Spray Painting.

WELDING - Robotic, Spot, Mig and Tig Welding f for all t types of metals and repairs.

DESIGN AND MANUFACTURE CUSTOM METAL PRODUCTS - FAMILY OWNED AND OPERATED



Piping with by pass and Heat Exchanger



1. Circulating Pump
2. System Fill Valve (12-15 PSI)
3. Thermostatic Mixing Valve
4. Expansion Tank
5. Vent Valve
6. Boiler Drain Valve
7. Union
8. Ball Valve

9. Gate Valve
10. Instantaneous Water Heater / Domestic Coil
11. Heat Generation Source (Fleetline Boiler)
12. Return Water Temperature Gauge
13. Zone Valve
14. Air Trap
15. Heat Exchanger
16. In Floor Heating Aquastat
Between 80 F° and 110 F°

PRODUCTS - Fleetline Hot Water Boilers, Bakery Ovens & Proofer, Heat Exchangers, eKOCOMFORT Products.

SERVICES - Product Development, Custom Fabrication & General Machining, Bakery Equipment Service.

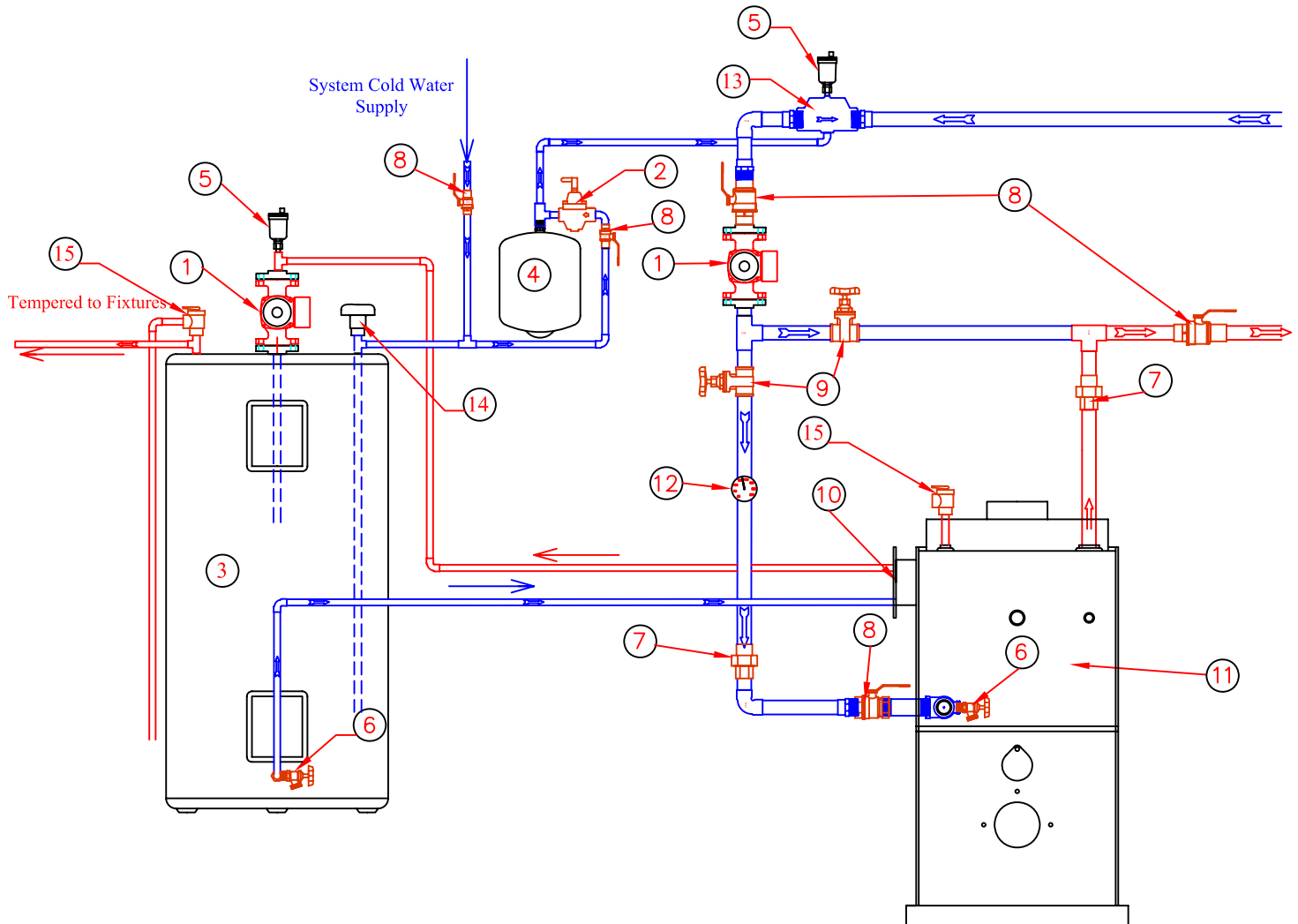
CUSTOM FABRICATION - Forming, Rolling (to 10ft.), Shearing, Flame and Plasma Cutting, Metal Stamping (200 t ton) and Spray Painting.

WELDING - Robotic, Spot, Mig and Tig Welding for all types of metals and repairs.

DESIGN AND MANUFACTURE CUSTOM METAL PRODUCTS - FAMILY OWNED AND OPERATED



Boiler Piping with by pass and Booster Tank



- | | |
|------------------------------------------------|-------------------------------------------------|
| 1. Circulating Pump | 11. Heat Generation Source (Fleetline Boiler) |
| 2. System Fill Valve (12-15 PSI) | 12. Return Water Temperature Gauge |
| 3. Storage Booster Tank | 13. Air Trap |
| 4. Expansion Tank | 14. Vacuum Breaker |
| 5. Vent Valve | 15. Pressure Relief Valve |
| 6. Boiler and Booster Tank Drain Valve | |
| 7. Union | |
| 8. Ball Valve | |
| 9. Gate Valve | |
| 10. Instantaneous Water Heater / Domestic Coil | |

Rev. Date Jul 1 2003

PRODUCTS - Fleetline Hot Water Boilers, Bakery Ovens & Proofers, Heat E Exchangers, eKOCOMFORT Products.

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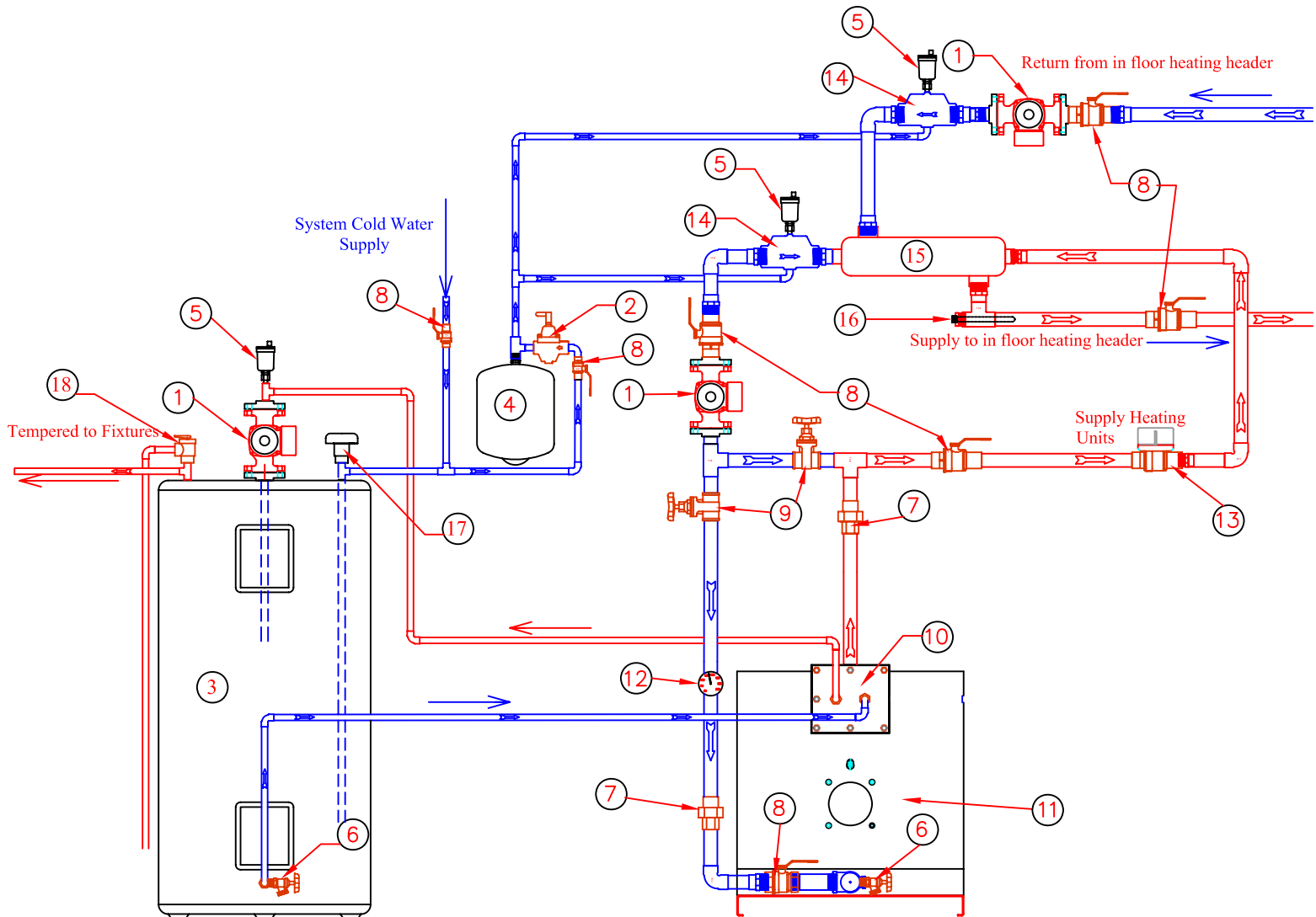
DESIGN AND MANUFACTURE CUSTOM METAL PRODUCTS - FAMILY OWNED AND OPERATED



BRANT STEEL
PRODUCTS LTD.

49 Craig Street, Brantford, Ontario N3R 7H8 519.756.5700 Fax: 519.756.1742 fabricate@brantsteel.com www.brantsteel.com

Boiler Piping with by pass and Heat Exchanger and Booster Tank



1. Circulating Pump
2. System Fill Valve (12-15 PSI)
3. Storage Booster Tank
4. Expansion Tank
5. Vent Valve
6. Boiler and Booster Tank Drain Valve
7. Union
8. Ball Valve
9. Gate Valve
10. Instantaneous Water Heater / Domestic Coil

11. Heat Generation Source (Fleetline Boiler)
12. Return Water Temperature Gauge
13. Zone Valve Opt.
14. Air Trap
15. Heat Exchanger
16. In Floor Heating Aquastat
Between 80 F° and 110 F°
17. Vacuum Breaker
18. Pressure Relief Valve

Rev. Date Jul 1 2003

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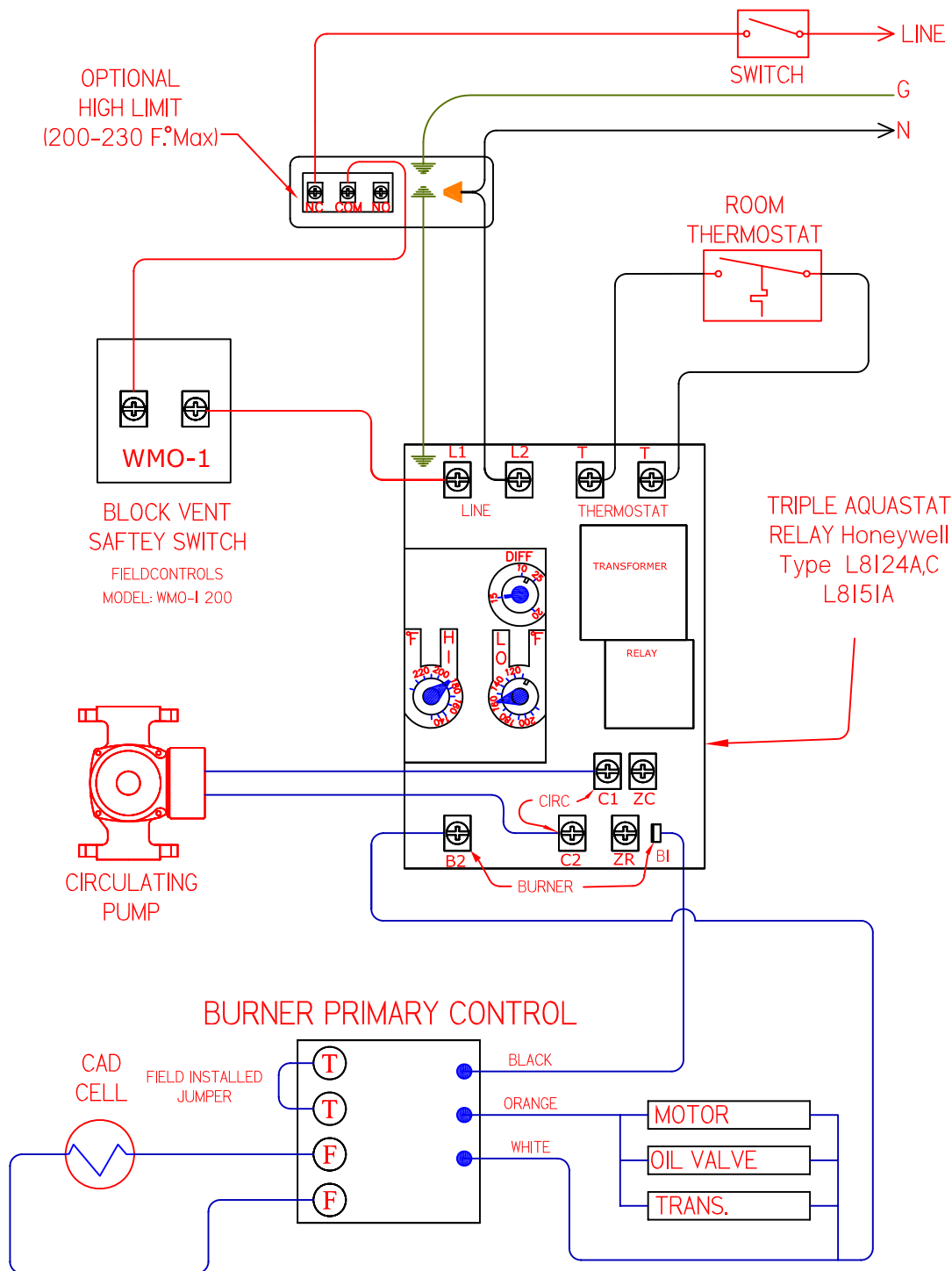
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Fleetline Boiler Wiring for BLOCK VENT SAFETY SWITCH



PRODUCTS - Fleetline Hot Water Boilers, Bakery Ovens & Proofers, Heat E Exchangers, eKOCOMFORT Products.

SERVICES - Product Development, Custom Fabrication & General Machining, Bakery E Equipment Service.

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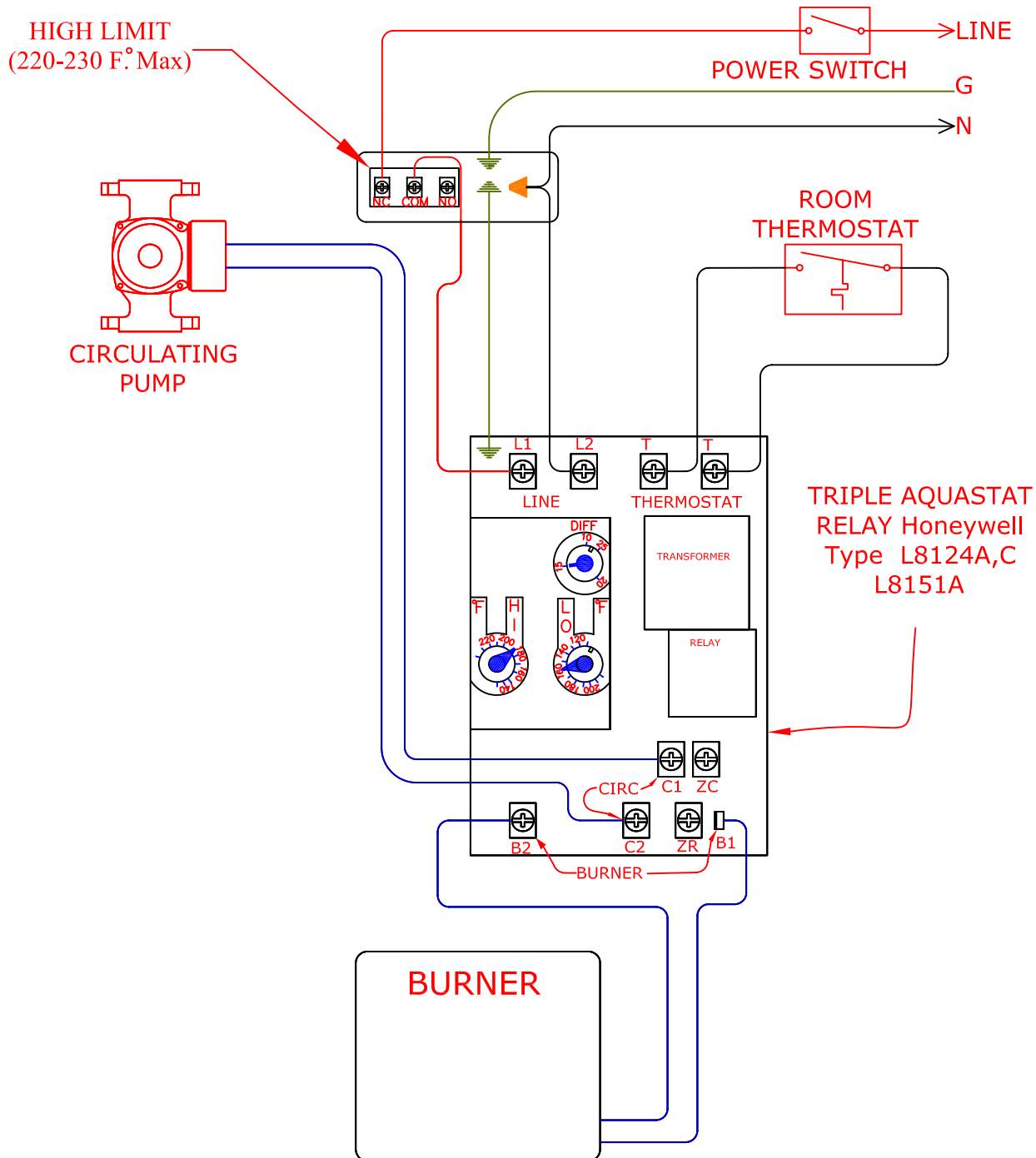
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Fleetline Single zone Wiring Drawing


 Rev. Date May 28 2001
PRODUCTS - Fleetline Hot Water Boilers, Bakery Ovens & Proofers, Heat E Exchangers, eKOCOMFORT Products.

SERVICES - Product Development, Custom Fabrication & General Machining, Bakery E Equipment Service.

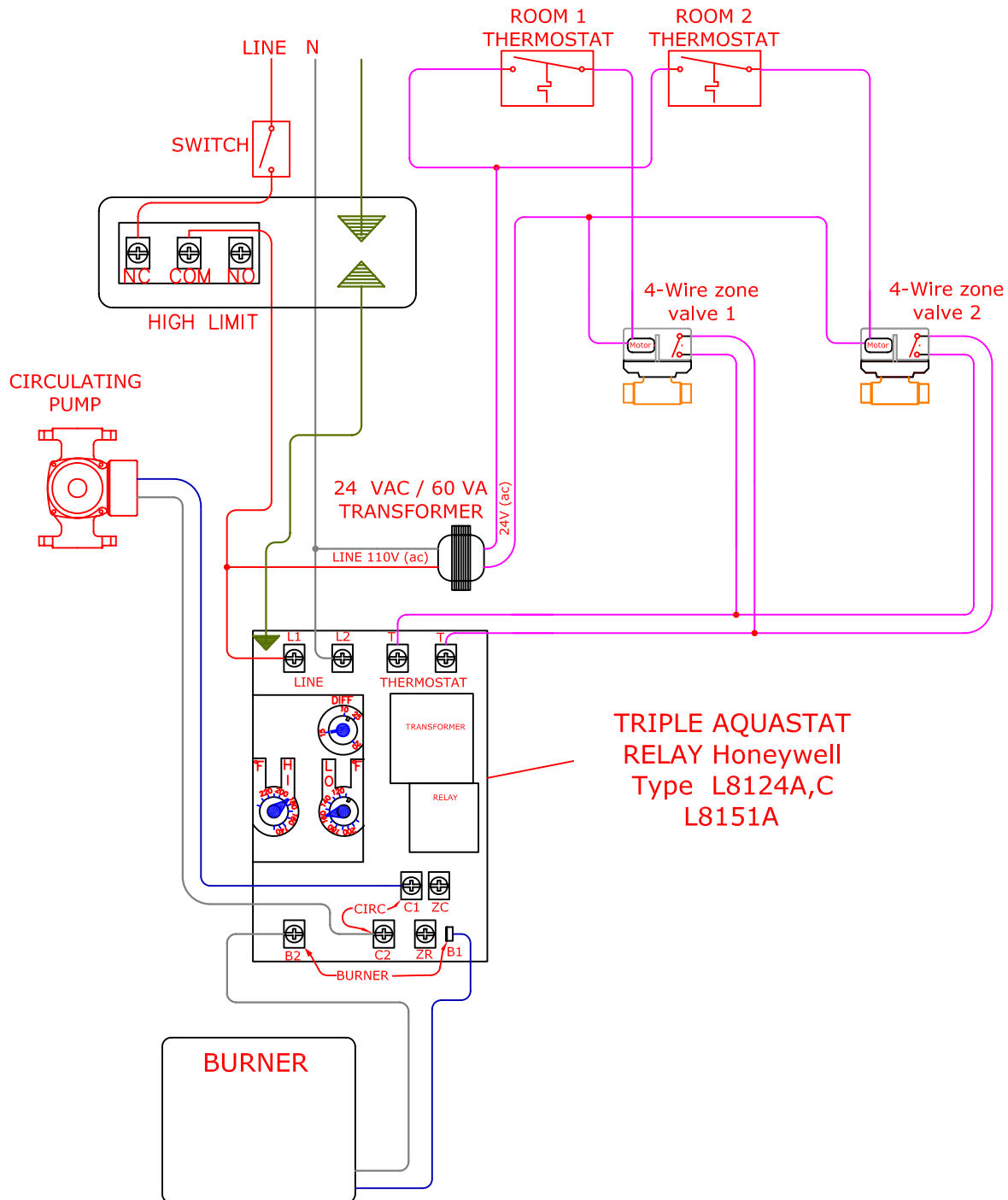
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DESIGN AND MANUFACTURE CUSTOM METAL PRODUCTS - FAMILY OWNED AND OPERATED



Fleetline Boiler Wiring For 2 Zone Drawing



PRODUCTS - Fleetline Hot Water Boilers, Bakery Ovens & Proofers, Heat E Exchangers, e eKOCOMFORT Products.

SERVICES - Product Development, Custom Fabrication & General Machining, Bakery E Equipment Service.

CUSTOM FABRICATION - Forming, Rolling (to 10ft.), Shearing, Flame and Plasma Cutting, Metal Stamping (200 t ton) and Spray Painting.

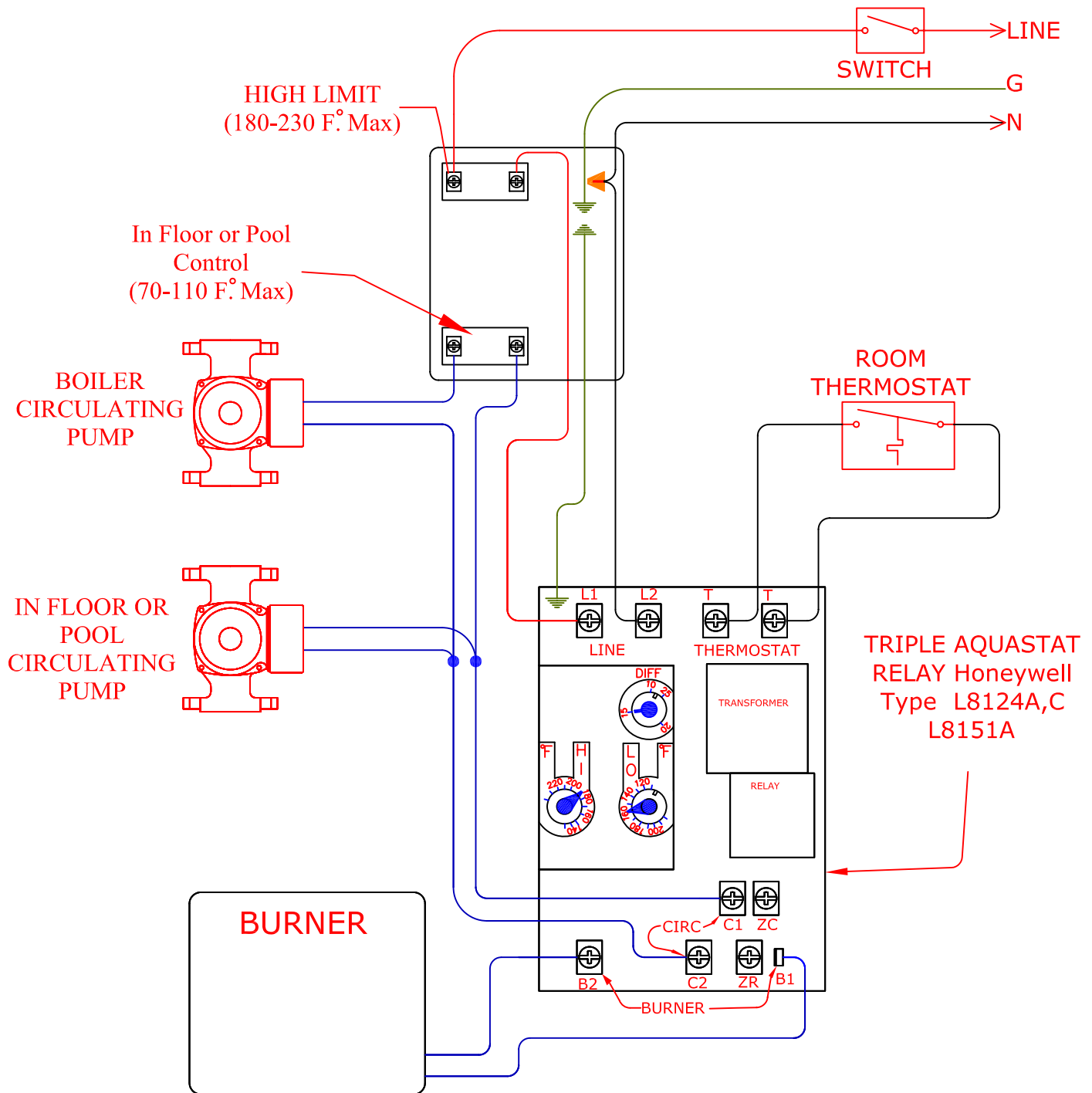
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DESIGN AND MANUFACTURE CUSTOM METAL PRODUCTS - FAMILY OWNED AND OPERATED


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Fleetline Single zone Floor or Pool Control Wiring Drawing


 Rev. Date Jul 1 2003
PRODUCTS - Fleetline Hot Water Boilers, Bakery Ovens & Proofers, Heat E Exchangers, eKOCOMFORT Products.

SERVICES - Product Development, Custom Fabrication & General Machining, Bakery E Equipment Service.

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DESIGN AND MANUFACTURE CUSTOM METAL PRODUCTS - FAMILY OWNED AND OPERATED



ESBE

THERMIC VALVE TV



ESBE **Thermostatic Bypass** valves type TV are designed to allow boilers to reach their optimum operating temperature quickly and to prevent cool/cold return temperatures from affecting them.

OPERATION/INSTALLATION:

Whether installed near the boiler outlet or inlet, the thermostat within the "TV" valve allows full flow through the bypass until the predetermined temperature is reached.

Supply Mounting: On the supply, the "TV" will allow flow of hot water to the system or indirect heater when the boiler outlet reaches 160 degrees Fahrenheit (72 degrees Celsius). At approximately 180 degrees Fahrenheit (82 degrees Celsius) most of the flow is directed to the system. Between 160 degrees Fahrenheit and 170 degrees Fahrenheit, the "TV" bypasses some supply water to mix with return water keeping operating temperatures high.

Return Mounting: On the return, "TV" allows full bypass until the return temperature reaches 140 degrees Fahrenheit (60 degrees Celsius). "TV" will begin opening while maintaining a 140 degree Fahrenheit minimum return temperature. When return temperatures reach approximately 158 degrees Fahrenheit (70 degrees Celsius) most of the flow will be through the system.

TECHNICAL DATA:

Temperature Ranges:

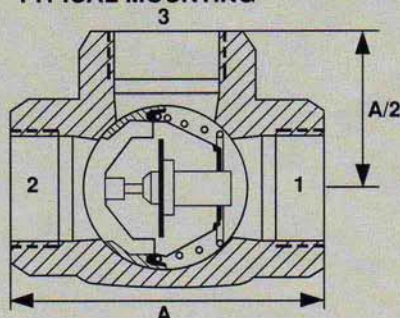
Standard: Supply mounted 160 °F/72 °C

Return mounted 140 °F/60 °C

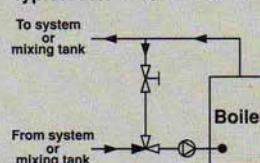
Optional: Special order requested.

START UP: With the balancing valve on the bypass fully open, operate the boiler until it reaches its normal operating temperature. If hot water does not automatically flow to the system then adjust (throttle) the bypass balancing valve until flow (hot water) to the system is established. If flow is already to the system, no adjustment is required.

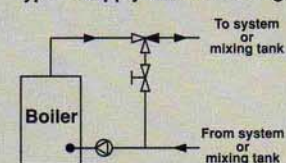
TYPICAL MOUNTING



Typical return valve mounting



Typical supply valve mounting



Type	Code No.	Size	Opening temp.	A	A/2	Cv	Weight
461 A	065 B 8920	1" NPT (Female x Female)	180 °F/72 °C	4.2	2.1	10.5	3.3 lb.
462 A	065 B 8921	1 1/4" NPT (Female x Female)	180 °F/72 °C	4.5	2.25	16.4	4.4 lb.
463 A	065 B 8922	1 1/2" NPT (Female x Female)	180 °F/72 °C	4.7	2.35	20.0	5.3 lb.
464 A	065 B-8923	1" NPT (Female x Female)	140 °F/60 °C	4.2	2.1	10.5	3.3 lb.
465 A	065 B 8924	1 1/4" NPT (Female x Female)	140 °F/60 °C	4.5	2.25	16.4	4.4 lb.
466 A	065 B 8925	1 1/2" NPT (Female x Female)	140 °F/60 °C	4.7	2.35	20.0	5.3 lb.

Max. operating pressure: 85 psi / 6 bar Max. operating Temperature: 230 °F (110 °C)

MOUNTING: "TV" can be installed in any position. An adjustable balancing valve (or ball valve) must be installed on the bypass.



Danfoss shall not be responsible for any errors in catalogues, brochures or other printed material. Danfoss reserves the right to alter its products at any time without notice, provided that alterations to products already on order shall not require material changes in specifications previously agreed upon by Danfoss and Purchaser.

Danfoss Automatic Controls

4971 Mercantile Road
Baltimore, Maryland 21236
USA
Telephone: (410) 931-8250
Telefax: (410) 931-8256

Danfoss Mfg.Co. Ltd.

1230 Lakeshore Road East
Mississauga, Ontario, L5E 1E9
Canada
Telephone: (905) 274-2311
Telefax: (905) 274-4009

clean
comfortable
efficient
versatile



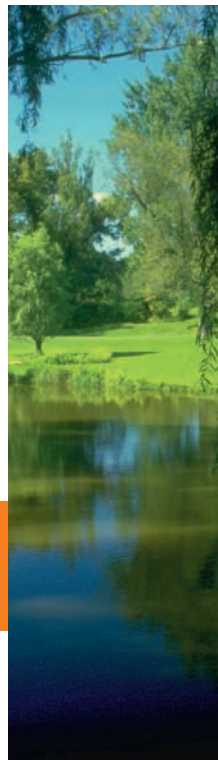
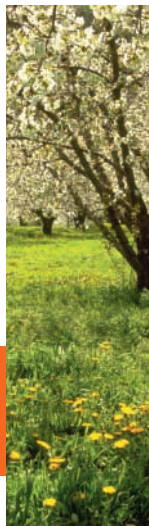
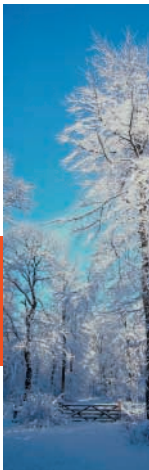
comfortable living...all year long

You'll appreciate a Fleetline Home Comfort System no matter what time of year! If you've never considered heating your home with hot water before, now is the time to take a serious look.

Aside from offering a comfortable, healthy environment in your home, there are many advantages to heating with hot water. The abundant supply of hot water means you do not need a separate water tank for dishes, showers and laundry. While providing the main source for heating your home, Fleetline hot water boilers also give you options such as in-floor radiant heat, snow melt systems, pool heating and more.

Before you get out that blanket on a cold wintery day, run out of hot water in the shower or find your feet getting cold, talk to us about an economical Fleetline Home Heating System.

clean
comfortable
efficient
versatile



20
YEAR
BOILER
Warranty

Aqua-Matic

advanced heating boiler



F-Series

2 in 1 heating system



- Fleetline boilers have earned a reputation for being reliable, economical and efficient from thousands of satisfied customers coast to coast.
- Continuous economical hot water for your family's needs from our internal water heater/tankless coil
- Internal stainless steel baffles for maximum heat transfer & efficiency
- Triple aquastat for energy conservation on ALL our boilers
- Meets A.F.U.E. standards
- Reliable production quality control and innovative features
- Excellent for new homes, retrofit or replacement
- Multi-firing range provides flexibility of the boiler's output
- Fuel choices: fuel oil, natural gas or propane
- Heating your home with hot water can provide a healthier environment for the entire family
- Ceramic fibre fire chamber for better and more environmentally friendly combustion
- Up to 89% combustion efficiency
- Easily serviced
- All controls are conveniently located on the boiler
- Internal water baffling to ensure even flow through the entire boiler, for better efficiency
- Small footprint means it fits in very small spaces



Fleetline

HOME COMFORT STARTS HERE

fleetline BOILER SPECIFICATIONS

Aqua-Matic

F-Series

FUEL OIL

Burner Model	Nozzle*	Pump Pressure PSI	(**) Input (BTUH)	EFF SS
Beckett AFG	.65 60°	160	100,028	88
	.75 60°	160	120,034	88
	.85 60°	160	140,890	87
	1.10 60°	160	183,386	85
Carlin EZ-1	.65 60°	160	105,169	89
	.75 60°	160	121,134	87
	.85 60°	160	141,874	86
	1.10 60°	160	182,830	86
Riello BF5	.65 60°	160	101,280	89
	.75 60°	160	120,264	88
	.85 60°	160	132,816	86
	1.10 60°	160	177,829	86

GAS

Burner Model	Input BTUH
Carlin EZ gas	70,000
	100,000
	120,000
	150,000
Riello 200	70,000
	100,000
	120,000
	150,000

Natural Co₂ 11.8%
Propane Co₂ 13.8%
All tests completed at 180°F (82.2°C) water temperature

FUEL OIL

Model	Input U.S. GpH		Gross Out BTU HR x 1000		Aero	Riello	PSIG	Nozzle				Net Output Sq. Ft.
	Aero	Riello	Aero	Riello				Aero	Riello	Angle 60°		
F-9	.50	.57	59	67	F-AFC-2X	40-F3	130	.50	.50	R	W	225
F-10	.65	.66	76	78	-2X	F3	175	.65	.50	Q	W	425
F-11	.85	.89	99	104	-2	F3	140	.85	.75	AR	W	547
F-12	1.00	.99	115	115	-2	F5	175	1.00	.75	Q	W	647
F-13	1.10	1.08	127	125	-2	F5	160	1.10	.85	Q	W	708
F-18	.85	.90	101	107	-2	F3	145	.85	.75	Q	W	550
F-19	1.00	1.02	118	122	-2	F5	145	1.00	.85	Q	W	650
F-20	1.10	1.20	132	141	-2	F5	145	1.10	1.00	Q	W	713
F-21	1.25	1.26	147	149	-3	F5	160	1.25	1.00	AR	W	833
F-22	1.35	1.39	160	161	-3	F5	160	1.35	1.10	AR	W	906
F-23	1.50	1.48	169	173	-4	F5	140	1.50	1.25	AR	W	990
F-24	1.75	1.65	197	191	-4	F10	175	1.75	1.25	AR	W	1160

* Brass nozzles lowest temperature during long firing tests.
Nozzles: Delevan W - Danfoss B - Hago B - Monarch R
** Test fuel 34.70 API gravity

* No heavier than No. 2 Furnace Oil — Electrical rating 120 Volt, 60 Cycle, less than 12 Amps
Maximum working pressure 30 PSI water — Certified for use with type "L" vent

DIMENSIONS

Dimensions (in)			Supply & Return	Boiler Water Capacity (Gallons)	Bare Boiler Weight (Lbs.)
Height	Width	Depth			
24"	24"	30"	1.25"	21	350



DIMENSIONS

Model	Dimensions (in)			Flue Dia.	Chimney Size	Return & Return	Boiler Water Capacity (Gallons)	Bare Boiler Weight (Lbs.)	Heating Surface (Sq. Ft.)
	Height	Width	Depth						
F9-13	36	22	22	6	8x8x20	1"	16	280	13
F18-24	42	22	22	7	8x8x20	1.25"	25	350	20



Verified for Energy Performance



Brant Steel Products, the manufacturer of the **FLEETLINE BOILER**, is part of the **eKOCOMFORT™** group of manufacturers responsible for the design and production of the Canadian Government recognized 'Integrated Home Comfort System'.

For more information, please contact us at 519-756-5700



Due to our continuous efforts to provide you with the latest in technology, specifications are subject to change without notice.

Manufactured in Canada by



BRANT STEEL
PRODUCTS LTD.

49 Craig Street, Brantford, Ontario N3R 7H8
Telephone: 519-756-5700 Fax 519-756-1742
email: fabricate@brantsteel.com
website: www.brantsteel.com