C&C BOILER Sales & Service, Inc.

♦ SALES ♦ SERVICE ♦ RENTALS ♦ PARTS

ARE YOU READY?

Guidelines for Preparing a Temporary Steam Plant

North Carolina – South Carolina – Virginia – West Virginia
www.ccboiler.com

BUILDING RELATIONSHIPS SINCE 1977

Corporate Headquarters
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P: 800.333.1631

Emergency Steam Plant Guidelines

INTRODUCTION

When operating a steam plant, there are many factors which determine the reliability and availability of a steam supply. Whether the steam is used to power a system or as a part of a process, mechanical engineers and power plant operators know that, in the majority of installations, management expects the system to run 24 hours a day throughout the year. Real-world conditions often make this impossible.

Often, there is a need for a temporary steam plant to replace or augment the permanent system for one of the following reasons:

- Unplanned outages for emergency repair
- Planned outages for repair, maintenance, or upgrades
- Increased capacity requirements to handle peak loads
- Testing of a new process or production run
- Research and development projects
- Delays in bringing new systems on line.

Although management expects steam plants to operate without interruption, as well as to meet new and changing requirements, the likelihood that one of the above listed factors will affect any steam plant operation in one year's time is 100%! Furthermore, the probability that some part of a steam plant will cause an interruption in service at least once during any year is about 20%.

One way to greatly improve the chances that your system will be able to supply steam reliably and without interruption is by planning for installation of a temporary steam plant. Typically, this means making adequate provisions for quickly installing a rental boiler and auxiliary equipment. Steam plant equipment that can be rented for both short-term and long-term periods include:

- Boilers
- Deaerators
- Water softeners, chemical feed systems
- Feedwater pumps
- Fuel oil heater sets
- Blowdown tanks
- Diesel generators
- Air compressors
- Valves
- Controls

The best time to plan for installing a temporary steam plant is before the need actually arises. Including provisions for a temporary steam plant can be very cost effective if accomplished when building a new facility, or when making changes to upgrade your current power boiler or steam plant. Such provisions can be as simple as installing additional connections for steam, water, fuel and power.

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BOILER REQUIREMENTS

There are three different types of boilers that are available for rent:

Type 1: Mobile steam plants consisting of a complete system with firetube boiler and auxiliaries mounted in a semi-trailer van. Units are prepiped and prewired.
Type 2: Trailer-mounted watertube boiler.
Type 3: Skid-mounted package watertube or firetube boiler.

The capacity and design pressures of these boilers are as follows:

CAPACITY	DESIGN PRESSURE	TYPE
100 hp (3,000 lb/hr)	150 psig, saturated	1
200 hp (6,000 lb/hr)	150 psig, saturated	1
250 hp (8,000 lb/hr)	200 psig, saturated	1
300 hp (10,000 lb/hr)	345 psig, saturated	3
500 hp (15,000 lb/hr)	200 psig, saturated	3
800 hp (27,000 lb/hr)	200 psig, saturated	3
21,000 lb/hr	260 psig, saturated	2
40,000 lb/hr	300 or 650 psig, saturated	2
50,000 lb/hr	300 psig, saturated	2
60,000 lb/hr	300 psig, saturated	2
70,000 lb/hr	300 psig, saturated	2
75,000 lb/hr	650 psig, saturated	2
90,000 lb/hr	350 psig, saturated	3
100,000 lb/hr	350 psig, saturated	2
120,000 lb/hr	350 psig, saturated or 750 psig/750°F	2,3
150,000 lb/hr	350 psig, saturated or 750 psig/750°F	3

Multiple boilers can be used in parallel to meet steam demands higher than the capacity of a single boiler.

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BOILER SIZE AND WEIGHT (approximate)

CAPACITY (W, H, L)	SHIPPING DIMENSIONS	SHIPPING WEIGHT	OPERATING
100 hp	8' x 14' x 30"	30,000 lbs	45,000 lbs
200 - 300 hp	8' x 14' x 30'	45,000 lbs	60,000 lbs
350 - 600 hp	8' x 14' x 30'	50,000 lbs	65,000 lbs
20 - 40,000 lb/hr	10' x 14' x 50'	60,000 lbs	80,000 lbs
40 - 60,000 lb/hr	10' x 14' x 50'	80,000 lbs	100,000 lbs
75 - 100,000 lb/hr	12' x 14' x 30'	100,000 lbs	125,000 lbs
150,000 lb/hr	10' x 16' x 40'	130,000 lbs	160,000 lbs

Temporary boilers require a firm foundation or footing. A concrete pad is the best support and asphalt is an acceptable alternative. At a minimum, a stable, well drained, compacted area is required with wood timbers sufficient to support the boiler's weight. The boiler must be blocked-up prior to operation. All weight must be removed from the running gear on trailer-mounted boilers.

BASIC EQUIPMENT SUPPLIED WITH A RENTAL BOILER

The following items are normally provided as a part of the complete rental boiler.

- Boiler
- Trailer
- Flame safeguard system
- Burner
- Feedwater controls
- F.D. fan, motor and starter
- Combustion controls
- Safety valves
- Blowdown valves
- Feedwater stop and check valves
- Steam gage and other trim
- Non-return valve

All other equipment is normally furnished by the customer or installer.

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FUELS

TYPE OF FUEL	SUPPLY PRESSURE
Natural gas	15 psig regulated
No. 6 fuel oil	150 psig regulated
No. 2 fuel oil	150 psig regulated and heated to 220ºF (approx.)

To determine the amount of fuel required:

Natural gas: Boiler size _____ lb/hr X 1.28 =_____SCFH
No. 2 fuel oil: Boiler size _____ lb/hr X 0.0095 =_____GPH
No. 6 fuel oil: Boiler size _____ lb/hr X 0.009 =_____GPH

NOTE: Horsepower X 34.5 =_____lb/hr

POWER REQUIREMENTS

CAPACITY	POWER (480VAC, 30, 60Hz)
5-10,000 lb/hr	50 Amps
10-20,000 lb/hr	75 Amps
20-40,000 lb/hr	100 Amps
40-65,000 lb/hr	150 Amps
65-100,000 lb/hr	200 Amps
100-150,000 lb/hr	Consult C&C Boiler

A disconnect switch must be provided between the power source and the rental boiler.

Temporary conduit and wiring should be installed after rental boiler arrives at the site.

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PIPING SIZE

150 PSI STEAM

CAPACITY	STEAM LINE	NATURAL GAS	FUEL OIL	FEED WATER	BLOWDOWN
10,000 lb/hr	4”	2”	.75”	1”	2”
20,000 lb/hr	6”	2.5”	.75”	2”	2”
30,000 lb/hr	6”	3”	.75”	2”	2”
40,000 lb/hr	8”	3”	1”	2”	2”
50,000 lb/hr	8”	3”	1”	3”	2”
60,000 lb/hr	8”	3”	1.5”	3”	2”
75,000 lb/hr	8”	4”	1.5”	3”	2”
100,000 lb/hr	10”	6”	2”	4”	2”
150,000 lb/hr	12”	6”	2”	4”	2”

650 PSI STEAM

CAPACITY	STEAM LINE	NATURAL GAS	FUEL OIL	FEED WATER	BLOWDOWN
30,000 lb/hr	4”	3”	.75”	2”	2”
40,000 lb/hr	6”	3”	1”	2”	2”
50,000 lb/hr	6”	3”	1”	3”	2”
60,000 lb/hr	6”	3”	1.5”	3”	2”
75,000 lb/hr	8”	4”	1.5”	3”	2”
100,000 lb/hr	8”	6”	2”	4”	2”
150,000 lb/hr	10”	6”	2”	4”	2”

All connections, 1.5 " and larger, should be flanged.

All piping should be ASTM A-106 Gr. B or A-53 Gr. B, SCH 80 or equivalent.

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INSTRUMENT AIR

On larger boilers, instrument air is required to drive the dampers, combustion controls, valves, and regulators. Generally, a supply of 1-2.5 SCFM of dry, clean instrument air regulated to 20-25 psig is sufficient.

WEATHER PROTECTION

Generally, all rental boilers are equipped with weather protection. However, if low temperatures are expected, provisions should be made to protect the boiler from freezing. A shelter in front, and around the boiler should be considered for the comfort of the operating personnel during inclement weather.

LOCAL CODES

Check local codes for stack height restrictions, emission limits, and other boiler installation requirements.

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FREQUENTLY ASKED QUESTIONS

1. WHO PROVIDES THE INSURANCE?
The Lessee agrees to provide full protection for the equipment. Generally Boiler & Marine and / or General Liability insurance policies will automatically cover this risk.

2. WHO PAYS FOR LOADING AND UNLOADING?
This is the Lessee's financial responsibility; C&C Boiler will arrange and invoice Lessee for loading and unloading at the shipping location. Lessee must arrange and pay for unloading and reloading at the plant site. Any crane charges are considered a loading or unloading charge.

3. WHO PAYS THE FREIGHT?
This is the Lessee's financial responsibility; C&C Boiler will use its own trucks if possible, if not C&C Boiler can make the arrangements. Lessee pays the shipping charge from the shipping location to plant site and return.

4. WHAT ABOUT OIL TANK?
If the Lessee does not have fuel storage facilities, then a local oil company can usually supply a temporary storage tank sometimes at no charge. This tank can be located on the ground alongside the boiler. Lessee will need to verify local codes are adhered too and provide adequate spill protection.

5. WHO SUPPLIES THE GAS REGULATOR?
Gas pressure regulators can be offered by C&C however verify the details with your representative to ensure the proper net regulated pressure is obtained prior to startup of the equipment.

6. WHO PROVIDES THE FLUE STACK?
Stub stacks up to 8ft in length are provided on most units. These are usually sufficient if ample building clearance exists.

7. WHO PROVIDES THE HOOKUP?
Connection and disconnection are “others” or at additional cost if offered by C&C Boiler Sales & Service, Inc. under separate cover. It is the Lessee's responsibility to verify that “hoses” and other means of installing the equipment are of proper service and consciously safe for the intended purpose. Steam and feed-water hoses are highly discouraged against.

8. WHO PROVIDES THE START-UP SERVICE?
C&C Boiler Sales & Service, Inc. or a duly authorized and trained professional boiler/burner service company provides the start-up service at an additional charge.

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9. WHAT ABOUT FUEL AND ELECTRICAL?
These are supplied by Lessee.

10. WHAT ABOUT FEEDWATER TREATMENT?
Normal boiler feedwater treatment which is regularly used at the plant site may be suitable for the rental boiler. Removal of any scale that might develop during operation is the responsibility of Lessee.

11. HOW SHOULD BOILER BE OPERATED?
Boilers should be operated by competent engineers. Any occurrence or damage other than normal wear and tear is the responsibility of the Lessee. Generally boiler operators on site can handle our automatic boilers along with their existing duties.

12. HOW IS EQUIPMENT TO BE PREPARED FOR RETURN SHIPMENT?
Equipment should be disconnected, drained, opened, washed out and inspected by plant personnel. It is always a good practice to note any abnormalities or variances due to the rental conditioning. Notify your C&C Boiler representative that unit is ready for release. This work is the responsibility of the Lessee.

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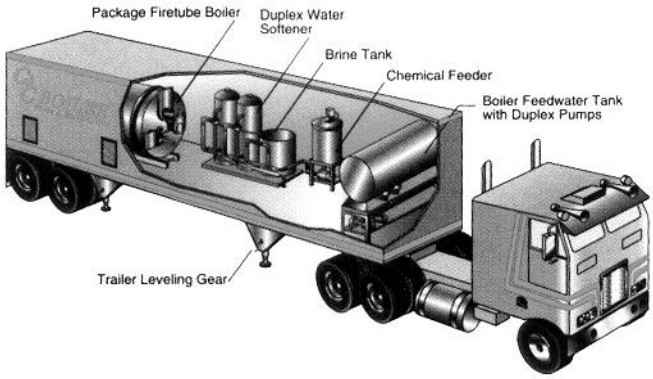
IMMEDIATE DELIVERY 24-HOUR SERVICE



READY TO RESPOND

C&C Boiler takes the EMERGENCY out of boiler EMERGENCIES

To any company depending on steam for heat processing or operation of equipment, the failure of a steam boiler is nothing short of a disaster. Production can be shut down for days or weeks, while a boiler is being repaired or replaced.

C&C Boiler can dispatch one of the mobile boiler systems within hours after your call. As quickly as the temporary piping connections are made into the building, coupled into the existing equipment, and the electrical power is run to the mobile boiler, steam pressure is up to normal and continues as long as needed. C&C Boiler has its own trucks along with piping and installation crews ready to respond as needed.

BOILERS IN STOCK IN CHARLOTTE

- Watertube Boilers to 70,000 lbs/hr - 300 psi
- Scotch Marine 15 hp to 800 hp - 345 psi
- Upright Tubeless to 30 hp - 150 psi
- Electric Boilers to 6 hp - 100 psi
- Hot Oil Heaters
- Feedwater Systems & Pumps
- Deaerators

TRAILER MOUNTED BOILERS

Trailer boilers are the most cost effective way of renting a boiler. They do not require a crane or rigging. This makes for fast delivery, easy installation, and reduces the time and cost of rental.

MOBILE STEAM PLANTS

Our mobile boiler rooms are a completely self-contained steam plant. They are the fastest and easiest way to provide steam. C&C Boiler's mobile boiler rooms have everything required including feedwater pump and tank, fuel oil pump, blowdown separator, chemical feed tank with pump, and stub-stack. All this completely piped and wired, ready for "hook up" at the job site.

RENTAL BOILERS

Rental boilers are an ideal and economical solution for temporary steam requirements. All of our rentals have been designed for easy hook up and most can be moved day or night. We have 24 hour service and our units are available immediately.

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AVAILABLE RENTAL BOILER UNITS

Unit	Boiler HP	Capacity	Manufacturer	FUEL	PRESS	TYPE
-	2029	70,000#/HR	Nebraska O with Faber	gas/#2	400	WT
TRAILER UNITS						
SB-95	350	12,075	Cleaver-Brooks CBR	gas/#2	150	FT
SB-52	300	10,350	Cleaver-Brooks w/ CST 300 gal	gas #2	150	FT
SB-35	300	10,350	Williams & Davis	gas/#2	345	FT
SB-59	250	8,625	Cleaver-Brooks CBE	gas/#2	150	FT
SB-36	200	6,900	Cleaver-Brooks CB	gas/#2	150	FT
SB-31	200	6,900	Cleaver-Brooks CB	gas/#2	150	FT
SB-61	200	6,900	Cleaver-Brooks CBE	gas/#2	200	FT
SB-124	70	2,415	Cleaver-Brooks CB	gas/#2	150	FT
SB-83	30	1,035	CBH w/ BFS on Trailer	gas/#2	150	FT
SKID BOILERS						
SB-117	800	27,600	CB CBEX 30ppm	gas/#2	200	FT
SB-102	800	27,600	Cleaver Brooks CBLE	gas/#2	200	FT
SB-53	800	27,600	Cleaver-Brooks CB	gas/#2	200	FT
SB-103	600	20,700	Cleaver Brooks CB	gas/#2	250	FT
SB-81	500	17,250	Cleaver-Brooks CB and CT	gas/#2	325	FT
SB-65	400	13,800	Industrial/ IC D175 & BFS	gas/#2	250	FT
SB-114	350	12,075	Cleaver Brooks 4WI 350 & CT503	gas/#2	150	FT
SB-94	25	863	Cleaver-Brooks	gas/#2	200	FT
SB-123	50	1,725	Cleaver-Brooks CFH-50-150S	Gas	150	FT
SB125	800	27,600	Cleaver-Brooks 4WI-200-800	Gas/#2	200	FT
SB126	800	27,600	Cleaver-Brooks 4WI-200-800	Gas/#2	200	FT
SB127	750	-	Cleaver-Brooks CFC-E700-750-150	-	-	-
SB128	150	-	Cleaver-Brooks CB700-150-150	-	-	-
SB129	60	-	Cleaver-Brooks CFH700-60-150	-	-	-
SB-05	15	518	Williams & Davis w/BFS	gas	150	FT
HOT OIL						
SB-39	-	3.5 Million	Eclipse	gas/#2	150	-

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SB-47	-	400 MBH	Vapor	gas	120	600F
DEAERATOR						
DA 103	-	30,000 lb/hr	CB Duotank	600 600	50	DA
DA 101	-	100,000	CB Deaerator	1000 gal	50	DA
DA-64	-	30,000 lb/hr	CB Duotank	300/300	50	DA
CONDENSATE TANKS						
TK 1102	-	640 Gallon	C&C Feedwater Syst	-	Atmos.	TK
CT 850	-	850 Gallon	C&C Feedwater Syst	-	Atmos.	TK
CT 851	-	850 Gallon	C&C Feedwater Syst	-	Atmos.	TK
CT852	-	850 Gallon	C&C Feedwater Syst	-	Atmos.	TK
CT 502	-	500 Gallon	C&C Feedwater Syst	-	Atmos.	TK
CT 503	-	500 Gallon	C&C Feedwater Syst	-	Atmos.	TK
CT 500	-	500 Gallon	C&C Feedwater Syst	-	Atmos.	TK
CT300	-	300 Gallon	C&C Feedwater Syst	-	Atmos.	TK
CT 250	-	250 Gallon	C&C Feedwater Syst	-	Atmos.	TK
CONDENSATE PUMPING SKID						
CPS 100	-	-	-	-	Atmos.	-
CPS 101	-	-	-	-	Atmos.	-
CPS 102	-	-	-	-	Atmos.	-
SKID STEAM UNITS						
40	-	100	Vapor	gas/#2	300	WT
41	-	100	Vapor	gas	300	WT
100	-	40 hp	Vapor KR2P4011VHJ	gas #2	600	WT
FUEL OIL STORAGE						
TK	-	1000 Gallon	Highland	-	Atmos	-
WATER SOFTENER						
WS 180-1	-	180 K	Culligan Duplex SMF365	-	-	-
WS300-1	-	300K	Marlo DuplexF-Glass	-	-	-
ECONOMIZER						
EC800	-	-	Cain	-	-	-

** Rental Units Current as of 08/23/18*

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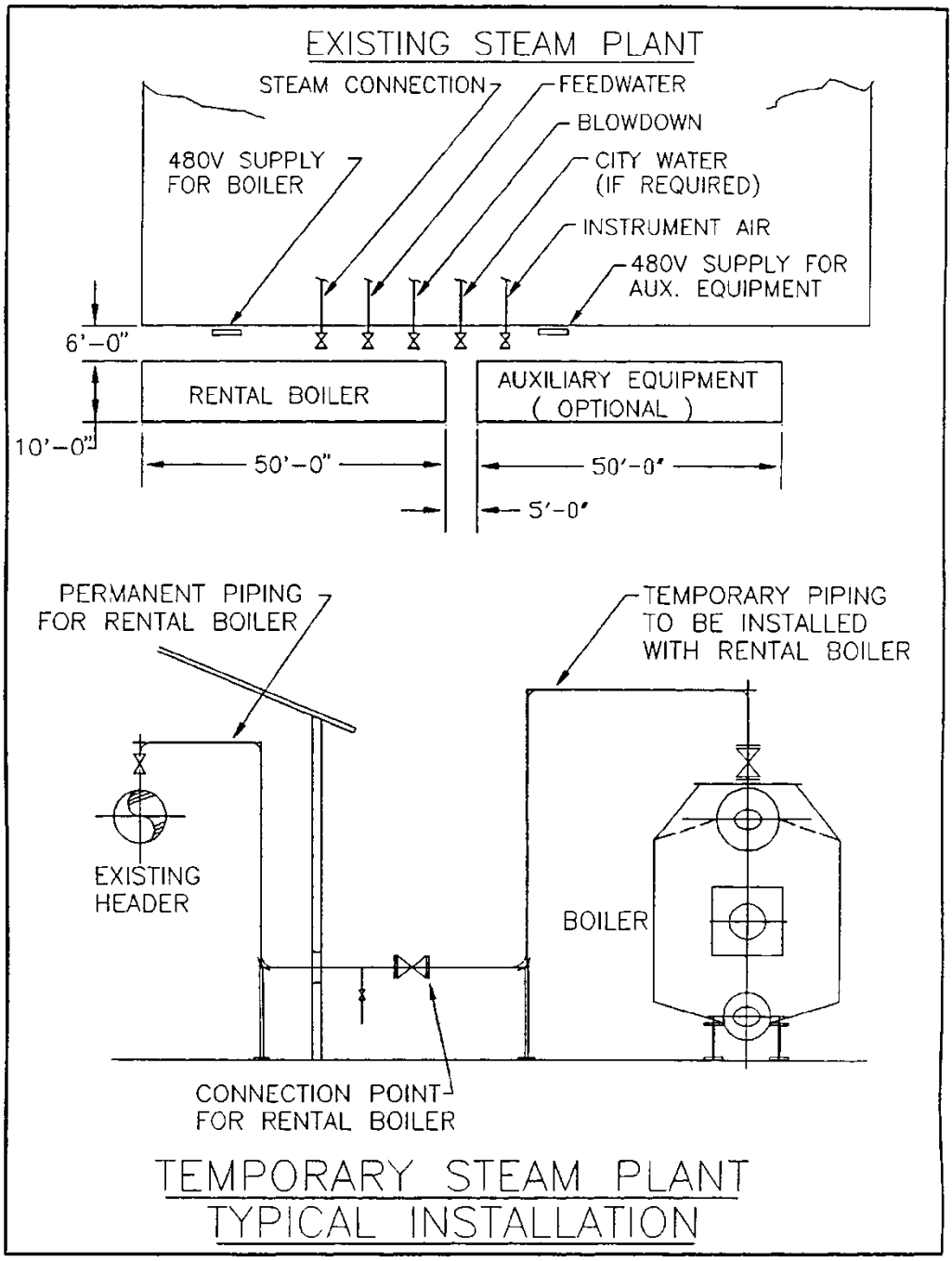
PIPING DIAGRAM



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RENTAL BOILER SPECIFICATIONS

When inquiring about a rental boiler, the following information is required.
Complete this form and send to C&C Boiler for a price quotation.

- FAX # 704.598.2242
- EMAIL: ben.hawley@ccboiler.com

Requestor Name: _____ **Title:** _____

Company: _____

Street Address: _____

City: _____ **State:** _____ **Zip:** _____

Telephone # _____ **Fax #** _____

Email Address: _____

BOILER REQUIREMENTS

Steam Pressure (design)	=	_____	psig
Steam Temperature	=	_____	°F
Steam Pressure (operating)	=	_____	psig
Steam Capacity	=	_____	lbs/hr
Fuel			
• Natural Gas	=	_____	
• #2 Fuel Oil	=	_____	
Emission Data (if available)			
• NOx	=	_____	ppm
• CO	=	_____	ppm
Electrical Power Available	=	_____	AMPS @480VAC, 30,60 Hz

AUXILIARY EQUIPMENT (Please check those items required)

- ❑ Economizer
- ❑ Deaerator
- ❑ Feedwater pump
- ❑ Water softener
- ❑ Chemical feeder
- ❑ Blowdown tank
- ❑ Other (please describe)

REQUIRED DELIVERY DATE: _____

REQUIRED RENTAL PERIOD: _____

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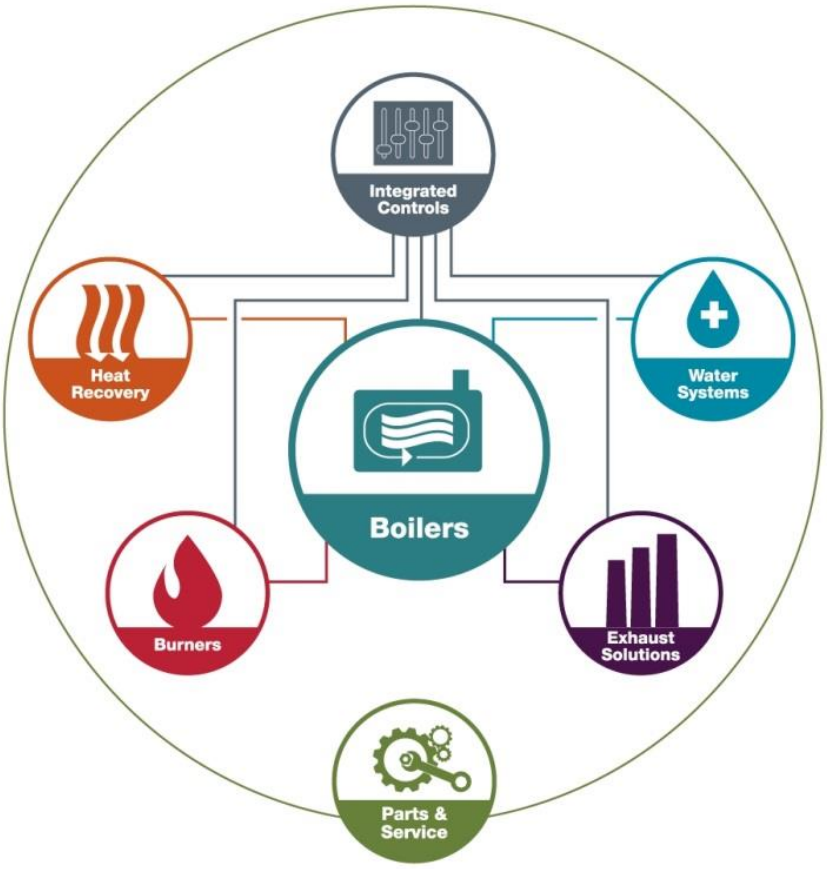

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