Honeywell

ECLIPSE

HeatPak Burners

Models RAHP20, RMHP30 and TAHP10

Operating Instructions

To European Standard: EN746-2: 2010

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Audience

This manual has been written for personnel already familiar with all aspects of a nozzle mixing burner package.

These aspects are:

- Installation
- Use
- Maintenance
- Safety

The audience is expected to be qualified and have experience of this type of equipment and its working environment.

Related Documents

Installation Guide

- This document

Datasheets 110, 114 and 115

- For respectively the RatioMatic, ThermAir and RatioAir

Component Documents

- Multi Bloc valve (VAG, VAS)
- Burner Control (BCU370 or BCU570)
- Modulating control actuator (IC20 or IC20E)
- Mechanical drawing
- Electrical wiring diagram

Document Conventions

There are several special symbols in this document. You must know their meaning and importance.

Following is an explanation of the symbols. Please read thoroughly.

How To Get Help

If you need help, contact Honeywell Eclipse or your local Eclipse representative.

	This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.
	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE	Is used to address practices not related to personal injury.
NOTE	Indicates an important part of text. Read thoroughly.

Table of Contents

Introduction 1

Product Description

The Heat Pak uses the burner heads of three different Eclipse burners: the RatioAir, RatioMatic or ThermAir which are then called the RatioAir Heatpak or RAHP, the RatioMatic Heatpak or RMHP and ThermAir HeatPak or TAHP.

The Heat Pak is a fully assembled compact burner package, configured for a chosen fuel type and supply voltage. All safety and control components are located in such way to make the burner as compact as possible, whilst maintaining easy access for service and maintenance. The HeatPak design provides a choice of options to suit the specific application requirements.

The Heat Pak burners have been designed and manufactured in accordance with ISO9001 quality procedures. The packages are assembled to comply with European standard EN 746-2.

The burner packages are designed to provide:

- Reliable operation
- Simple adjustments
- Direct spark ignition
- Modulating control (Air and gas for the RAHP and RMHP or gas only with the TAHP)
- Selectable options to suit the application requirements.

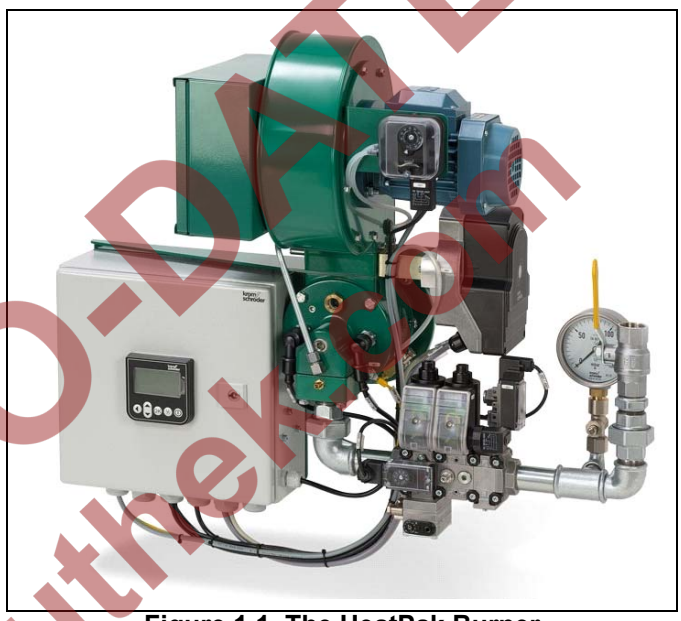


Figure 1.1. The HeatPak Burner

Safety 2

Introduction

This section is provided as a guide for the safe operation of the Eclipse HeatPak burner packages. All involved personnel should read this section thoroughly before operating this system.

Safety Warnings

⚠ DANGER

- **The burners covered by this Guide are designed to mix gas with air and burn the resulting mixture. All gas burning devices are capable of producing fires and explosions if improperly applied, installed, adjusted, controlled or maintained.**
- **Do not bypass any safety feature! Fire or explosion could result.**
- **Never try to light a burner if it shows signs of damage or malfunction.**
- **Burners are factory wired for direct air heating applications, which means a closed air valve purge before ignition.**
- **For in-direct applications where burner is firing on a closed chamber, ensure that air purge requirements according the applicable standards are fulfilled. Attached wiring diagram shows wiring changes necessary for full open-air valve purge.**

NOTE: Personal safety and the Safety of others is a direct result of how equipment is installed, operated and maintained. Read and understand this Guide before attempting to light the burner. The Guide provides information for installing, operating and maintaining the Eclipse burner within the limits of its design specifications. Do not deviate from any instructions or application limits without written advice from Honeywell Eclipse.

Capabilities

Only qualified personnel, with good mechanical / electrical aptitude and experience with combustion equipment, should adjust, maintain or troubleshoot any mechanical or electrical part of this system.

Installation 3

Introduction

This section provides guidance for correct installation of the Eclipse Heatpak burner packages.

WARNING

- **Only qualified competent personnel with experience of combustion systems are allowed to install, adjust or maintain the burner.**
- **All installation work must be carried out in compliance with current legislated standards.**

Handling

- Inspect the burner package, ensuring that all components are clean and free from damage.
- Use appropriate support and handling equipment when lifting the burner.
- Protect the burner from weather, damage, dirt and moisture.
- Protect the burner package from excessive temperatures and humidity (refer to burner specification).

Storage

- When storing the burner for an extended period, Eclipse recommends placing it in a cool, clean, dry room.

Pre-Installation Checklist

Air Supply

Provide an opening in the burner room with a free surface of at least 6 cm^2 per kW of the maximum burner firing rate to supply the burner with fresh, outdoor, combustion air.

Exhaust

Do not allow exhaust gases to accumulate in the work area.
Provide a means for exhausting these gases from the building.

Access

Install the burners so they may be easily accessed for inspection and maintenance.

Environment

Be sure the burner-operating environment matches the original operating specifications. Check the following items:

- Voltage, frequency, and stability of power.
- Fuel type and supply pressure.
- Adequate fresh and clean combustion air.
- Humidity, altitude and temperature of the supply air.
- Presence of damaging corrosive gases in the air.
- Prevent direct exposure to water.

Burner Mounting

Chamber Opening

Provide an opening in the chamber wall at least 12 mm larger in diameter than the outside diameter of the combustor.

Provide an accessible pressure tap on the chamber wall to measure the pressure inside the firing chamber. The pressure tap should be located near the burner.

Mounting Pattern

Attach 4 mounting bolts to the chamber wall. Position these bolts to match the clearance holes on the burner-mounting flange. Refer to the appropriate basic burner data sheet and figures 3.1 and 3.2 below.

Chamber Wall

Make sure the chamber wall is strong enough to support the weight of the burner. If necessary, reinforce the mounting area.

Burner Mounting

1. Be sure gasket is installed between burner and chamber wall.
2. Pack fibre insulation around the combustor to a depth not beyond the nozzle position, as illustrated.
3. Mount burner to chamber wall using 4 customer supplied nuts and lock washers.

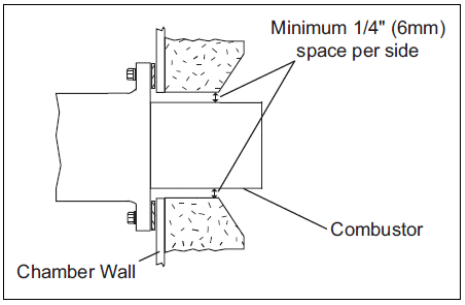


Figure 3.1 Chamber opening for Ratiomatic.

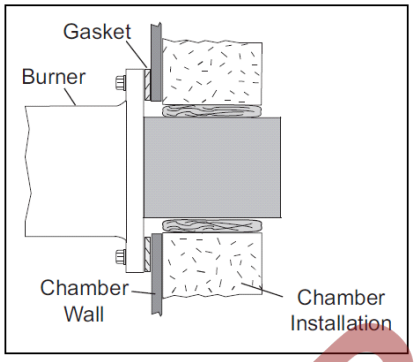


Figure 3.2 Chamber opening for RatioAir and ThermAir.

Gas Supply

The burner package should not be used as a support for the incoming gas supply pipe work. Suitable brackets or hangers should be provided for this purpose. Care should be taken to ensure that the incoming gas pipe is adequately sized for the necessary gas flow and burner pressure (See appropriate data sheet for gas pressure requirements).

WARNING

- **Gas inlet pressures must stay within the specified range. Pressure above the specified range can damage the ratio regulator.**
- **Pressure below the specified range can impair the ability of the ratio regulator to control the gas flow.**

Electrical Supply

A 3-phase electrical supply must be provided with an isolator adjacent to the burner position. An external single phase supply must also be available.

WARNING

- **Wiring to the burner must be in accordance with current wiring standards. It is vital that the live and neutral wires are connected correctly as reversal could present a hazard. Also the earth bonding must be checked to ensure a good connection. (Wiring diagrams are provided with this Guide.)**
- **GAS PIPEWORK MUST NOT BE USED FOR EARTHING PURPOSES.**
- **If burner control signals are supplied via a flame safeguard control panel provided by others, Honeywell Eclipse can not accept any responsibility for incorrect interfacing.**

Checklist After Installation

To verify the system was properly installed, perform the following checks:

1. Be sure there are no leaks in the gas lines.
2. Be sure all wiring is properly connected.
3. Be sure the blower rotates in the proper direction. If the rotation is incorrect, have a qualified electrician rewire the blower to rotate in the proper direction.
4. Be sure the correct gas orifice is installed, selected for the available gas type.

4 Description of Burner Operation

Description of Start Up Sequence for Ratio Regulated Burner (RAHP or RMHP)

The complete start-up sequence is controlled by the burner programmer (This may be supplied with the burner or, it may be installed in a separate control panel supplied by others).

The combustion chamber must be purged in accordance with current standards prior to the burner start up sequence. If the combustion air blower is used for purging the combustion chamber, the burner must have been wired to control the air valve fully open during the purge time.

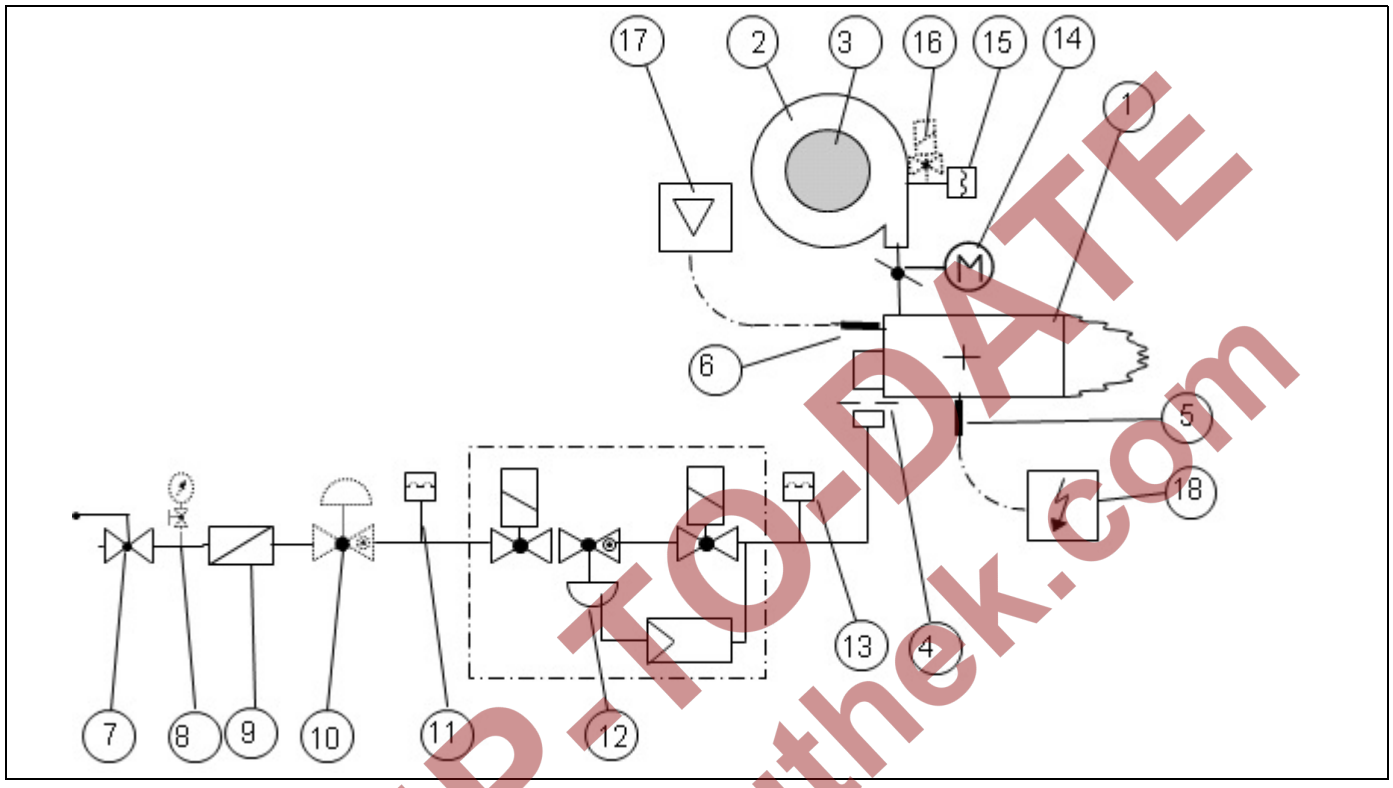
After the start up signal to the burner, the combustion air blower (PID item 2) will be energized. As soon as the combustion air pressure switch (PID item 15) is activated by sufficient combustion air pressure and the microswitch in the control motor is closed, the burner programmer (PID item 17) starts to cycle. The air valve will now be controlled to its start position (approx. 10° valve angle, or 10% of the maximum burner capacity).

The ignition transformer (PID item 18) will be energised by the burner programmer and a spark will be generated at the ignition electrode (5). The safety shut-off valves (PID item 12) will next be energised. The gas flows through both safety shut-off valves and the internal gas ratio-regulator (PID item 12) to the burner nozzle, where it mixes with the combustion air and ignites. The flame is detected and monitored by a flame ionisation probe or an ultra violet scanner (6).

After the flame detection device is satisfied that a stable flame has been established, the burner programmer releases the burner for control by the temperature controller (supplied by others). The modulating control motor will be positioned to satisfy the set point of the temperature controlling instrument. The air valve opens which results in an increased air pressure at the burner. The gas ratio-controller supplies a gas flow corresponding to the amount of combustion air.

The high fire gas flow is limited by an integral gas orifice selected for a specific gas type. With this concept, no high fire adjustment has to be made

Diagram (PID) of Ratio regulated HeatPak (RAHP or RMHP)



Standard items

1. Burner
2. Blower
3. Air filter
4. Gas orifice
5. Igniter
6. Flame supervision
7. Manual shut off valve
8. Optional Pressure indicator
9. Optional gas filter
10. Optional gas pressure regulator
11. Low gas pressure switch
12. Double solenoid valve with ratio regulator
13. High gas pressure switch
14. Air damper with control motor
15. Air pressure switch
16. Optional 3-way solenoid valve
17. Optional burner programmer
18. Ignition transformer

Description of Start Up Sequence for Gas Regulated Burner (TAHP)

The complete start-up sequence is controlled by the burner programmer (This may be supplied with the burner or, it may be installed in a separate control panel supplied by others).

The combustion chamber must be purged in accordance with current standards prior to the burner start up sequence. If the combustion air blower is used for purging the combustion chamber, the burner must have been wired to control the air valve fully open during the purge time.

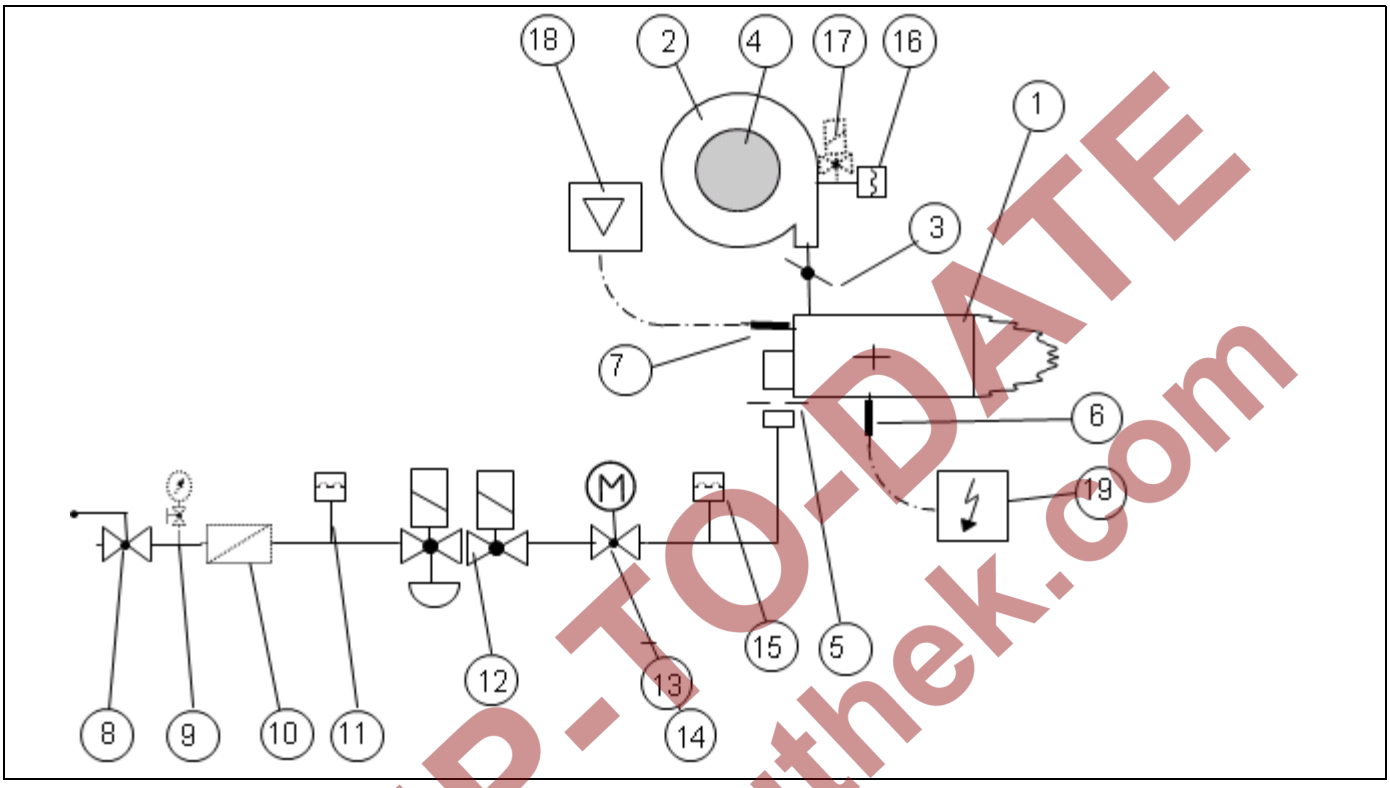
After the start up signal to the burner, the combustion air blower (PID item 2) will be energised. As soon as the combustion air pressure switch (PID item 16) is activated by sufficient combustion air pressure and the microswitch in the control motor is closed, the burner programmer (PID item 18) starts to cycle. The gas valve will now be controlled to its start position (approx. 10° valve angle, or 10% of the maximum burner capacity).

The ignition transformer (PID item 19) will be energised by the burner programmer and a spark will be generated at the ignition electrode (PID item 6). The safety shut-off valves (PID item 2) will next be energized. The gas flows through both safety shut-off valves and the internal gas ratio-regulator (PID item 12) to the burner nozzle, where it mixes with the combustion air and ignites. The flame is detected and monitored by a flame ionisation probe or an ultra violet scanner (7).

After the flame detection device is satisfied that a stable flame has been established, the burner programmer releases the burner for control by the temperature controller (supplied by others). The modulating control motor will be positioned to satisfy the set point of the temperature controlling instrument. The gas valve opens which results in an increase in capacity.

The gas ratio regulator limits the gas pressure upstream the gas valve preventing the burner going into a gas rich ratio. The limit is ultimately made by the integral gas orifice (PID item 5). The air flow is fixed, but can be adjusted with the optional manual air damper (PID item 3).

Diagram (PID) of Gas regulated HeatPak (TAHP)



Standard items

1. Burner
2. Blower
3. Optional Air damper
4. Air filter
5. Gas orifice
6. Igniter
7. Flame supervision
8. Manual shut off valve
9. Optional Pressure indicator
10. Optional gas filter
11. Low gas pressure switch
12. Double solenoid valve with ratio regulator
13. Gas control valve
14. Control motor
15. High gas pressure switch
16. Air pressure switch
17. Optional 3-way solenoid valve
18. Optional burner programmer
19. Ignition transformer

General Safety Features

Apart from the start-up sequence which is described in the previous paragraphs, the Heatpak is equipped with several other safety features which are required by EN746-2.

The Heatpak has a low gas pressure switch and a high gas pressure switch to guard respectively the burner for low gas flow and high gas flow.

Then the Heatpak is also equipped with a low air pressure switch to ensure there is always enough combustion air to fully combust the fuel gas for the required capacity.

Exceeding the set pressures on all switches will lead to a lock-out of the burner programmer. The optional BCU370 will not make a destinction between high or low gas pressure switch, it will give the same failure.

The Heatpak burner is foreseen with a required flame guarding sensor in the form of a UV scanner or a Ionization probe. The latter is only available when the burner technology allows this sensor.

Absence of flame signal must lead to lock-out of the burner programmer.

The Heatpak can optionally be equipped with a burner programmer. If this burner programmer is chosen then the safety features are incorporated in the programmer and the start-up sequence. If the burner programmer is not chosen then the customer is responsible for using the safety features correctly and perform a correct start-up sequence.

Commissioning 5

Installation

This section describes how to start up and adjust the Eclipse HeatPak burner packages.

DANGER

- **The burners covered by this Guide are designed to mix gas with air and burn the resulting mixture. All gas burning devices are capable of producing fires and explosions if improperly applied, installed, adjusted, controlled or maintained.**
- **Do not bypass any safety feature! Fire or explosion could result.**
- **Never try to light a burner if it shows signs of damage or malfunction.**

Commissioning for RAHP and RMHP

Factory Settings

The burner is factory adjusted such that in most application no additional adjustments are necessary but fine-adjustment of the low fire gas flow.

- Burner air valve is set for a full 0 - 90° travel. This setting is suitable for slightly negative to slightly positive chamber pressures.
- Pressure-switches are pre-set to correct values.
- Burner is wired for a closed air valve purge for use on direct fired systems.
- Burner gas orifice is selected for the specified gas type.

Adjustment

1. Preparation
2. Dry run
3. Combustion air check
4. Start-up and low fire adjustment
5. Operating checks

Step 1: Preparation

1. Ensure all installation work has been completed in compliance with current legislated standards.
2. Ensure that all gas supply pipework has been purged of air in compliance with current legislated standards.
3. Ensure that all required services are available.
4. Ensure that all pre-checks have been completed in compliance with current legislated standards.
5. Ensure that the following instruments are available
   - digital or “U” - tube manometer for pressure adjustments.
   - µA- meter to measure flame signal strengths.
6. Check the setting of the maximum gas pressure switch and the minimum air pressure switch. The maximum gas pressure switch is adjusted 20 % higher than the maximum gas pressure. The minimum air pressure switch is adjusted at approx. 50 % of the maximum air pressure, as mentioned in the ”Burner Specification & Operating data”.

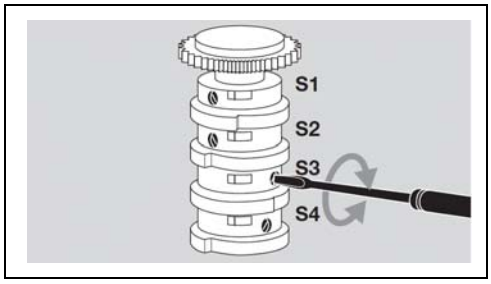
Step 2: Dry run

1. Ensure that the machine is ready to process the heat from the Heatpak.
2. Ensure the manual isolating ball valve is closed.
3. Initiate the electrical supply to start the operating sequence. If the combustion air blower is remotely controlled, ensure that the blower is running. If the burner programmer is burner mounted, turn the on/off switch to the "on" position. If the sequence is operating correctly, the programmer will run through to the point of ignition, the safety shut-off valves will open and, in absence of a flame, will proceed to a lockout condition.

DANGER

- **If simulated limits or simulated flame failures do not shut down the fuel system within the required response time, immediately correct the problem before proceeding.**

4. Verify that the air valve control motor opens the air BV towards the back of the burner as shown. If it doesn't, refer to the control motor literature for instructions on how to reverse the direction.
5. Verify that the increased start position of the control motor is set at 10° air valve opening. If necessary, adjust by turning the cam inside the control motor. See drawing on next page.



Switch	Function
S1	Start
S2	Free
S3	High Fire
S4	Low Fire

Step 3: Combustion air check

Low fire air adjustment procedure:

1. Start the combustion air blower.
2. Drive control motor to low fire position (set the Temperature controller to manual).
3. Measure air differential pressure between tap (C) and combustion chamber.
4. If necessary, adjust low fire air by turning the yellow cam inside the control motor.

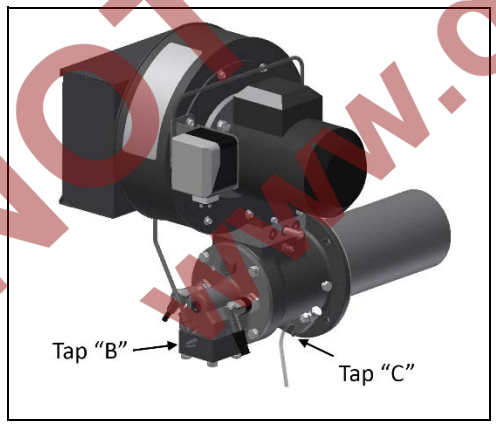


Figure 5.1

NOTE: The slot at the end of the BV (air damper) shaft indicates the position of the BV. The BV is closed when the shaft slot is perpendicular to the direction of air flow through the BV.

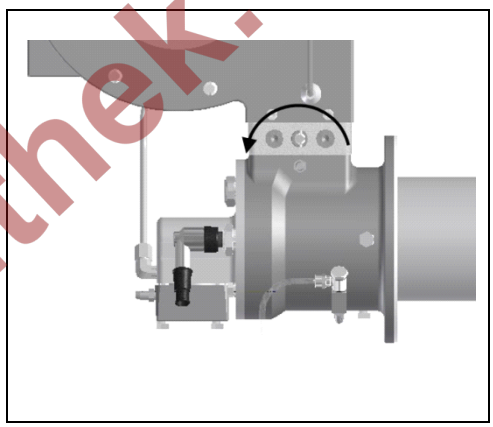
For adjustment of the BV, refer to attached control motor literature and "Practical notes on applied components".

For most applications, the factory setting of the BV (fully closed) gives the correct amount of low fire air. Only at high positive chamber pressure conditions, it may be necessary to set the low fire position to slightly open in order to get sufficient air differential pressure.

The normal values of air pressures are giving in the "Burner Specification & Operating data" which can be found later in this document.

High fire air adjustment is not required if burner is firing into a neutral or positive pressure chamber. Only at high negative chamber pressures, it may be necessary to limit the control motor travel to avoid over-firing the burner.

Contact your local Honeywell Eclipse representative for further information.



5. Verify high fire air
   a. Drive control motor to high fire, full open.
   b. Compare high fire air differential pressure between tap "C" and the combustion chamber with the burner "Operating data". If high fire air is insufficient, refer to Section 6, "Troubleshooting and Maintenance".
6. Return the control motor to low fire position.
7. Close the pressure taps.

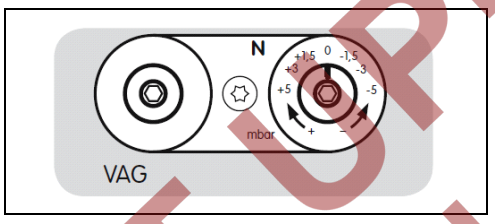
Step 4: Start-up

Start-up procedure:

1. Drive control motor to low fire
2. Ensure that the process air blower is running.
3. Open the manual isolating ball valve.
4. Initiate the electrical supply to start the operating sequence. If the combustion air blower is remotely controlled, ensure that the blower is running. Under control of the burner programmer, ignition should be

accomplished. If the burner does not light the first time it will be necessary to reset the burner programmer.

5. If the burner does not ignite:
   a. Attempt to ignite the burner again to purge air from the gas piping.
   b. If the burner still does not ignite, turn bias adjusting screw a ½ turn counter-clockwise to increase gas flow.
   c. Attempt to ignite burner.
   d. Repeat steps b and c until burner ignites. If necessary, refer to Section 6 for trouble-shooting tips. The burner has now started at the increased start position. The flame should just come out of the combustor. If not increase gas flow until the flame is visible.
6. Set the temperature controller to manual and set the burner control motor to low fire position. If the burners goes to flame failure, repeat step 6d after increasing the gas flow with a ½ turn of the bias screw.
7. Adjust gas flow with the low-fire bias adjustment screw on the VAG for lowest gas flow that maintains a stable flame signal (see figure below):
   - clockwise, for more fuel
   - counterclockwise, for less fuel



NOTE: If viewing the flame at low fire through the peepsight, it should be blue with flashes of yellow. The flame should be completely within the combustion tube. When firing propane or butane, a proper low fire flame may have sustained flashes of yellow.

8. Verify low fire flame:
   a. Shut off gas. When chamber temperature is below 120 °C, shut off combustion air blower.
   b. Restart burner.
   c. Verify repeatability of ignition and low fire flame signal.

NOTE: Because of the integral gas orifice, selected for a specific fuel type, there is no high fire gas adjustment.

Step 5: Operating checks

1. Simulate a flame out condition by closing the manual inlet ball valve. Run the ignition cycle again.
2. Check high gas pressure switch for correct operation by reducing the set point until it trips. The burner must be at high fire. Re-set to the original setting and run the ignition cycle again.
3. Check the combustion air pressure switch for correct operation by increasing the set point until it trips. Re-set to the original setting and run the ignition cycle again.
4. Measure and record the gas and air differential pressure and flame signal at low and high fire for future reference.

Gas pressure to be measured at tap B (see figure 5.1).

CAUTION

- **Do not turn the combustion air blower off until the chamber temperature is below 120°C. This will prevent hot gases from flowing back through the burner and the blower and causing damage to the burner.**

Commissioning for TAHP

Factory Settings

The burner is factory adjusted such that in most application no additional adjustments are necessary but fine-adjustment of the low fire gas flow.

- Burner gas valve is set for low to high fire travel. This setting is suitable to achieve low to high fire for slightly negative to slightly positive chamber pressures.
- Gas pressure upstream the gas valve needs no adjustment, because it is established by the ratio regulator which is driven by blower pressure and gas orifice for the specified gas type.
- Pressure-switches are pre-set to correct values.

Adjustment Steps

1. Preparation
2. Dry run
3. Combustion air check
4. Start-up and low fire adjustment
5. Operating checks

Step 1: Preparation

1. Ensure all installation work has been completed in compliance with current legislated standards.
2. Ensure that all gas supply pipework has been purged of air in compliance with current legislated standards.
3. Ensure that all required services are available.
4. Ensure that all pre-checks have been completed in compliance with current legislated standards.
5. Ensure that the following instruments are available
   - digital or “U” - tube manometer for pressure adjustments.
   - µA- meter to measure flame signal strengths.
6. Check the setting of the maximum gas pressure switch and the minimum air pressure switch. The maximum gas pressure switch is adjusted 20 % higher than the maximum gas pressure. The minimum air pressure switch is adjusted at approx. 50 % of the maximum air pressure.

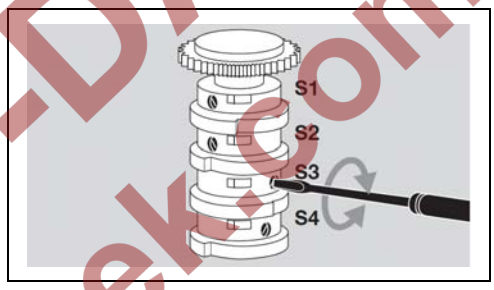
Step 2: Dry run

1. Ensure that the machine is ready to process the heat from the Heatpak.
2. Ensure the manual isolating ball valve is closed.
3. Initiate the electrical supply to start the operating sequence. If the combustion air blower is remotely controlled, ensure that the blower is running. If the burner programmer is burner mounted, turn the on/off switch to the "on" position. If the sequence is operating correctly, the programmer will run through to the point of ignition, the safety shut-off valves will open and, in absence of a flame, will proceed to a lockout condition.

DANGER

- **If simulated limits or simulated flame failures do not shut down the fuel system within the required response time, immediately correct the problem before proceeding.**

4. Verify that the increased start position of the control motor is set at 10° air valve opening. If necessary, adjust by turning the cam inside the control motor (see figure below).



Switch	Function
S1	Start
S2	Free
S3	High Fire
S4	Low Fire

Step 3: Combustion air check

Air check procedure:

1. Start the combustion air blower.
2. Measure air differential pressure between tap (C) and combustion chamber and check with air setting in the Burner Operating table for the TAHP further in this document.
3. As this burner is a burner running with fixed air no further settings are necessary.

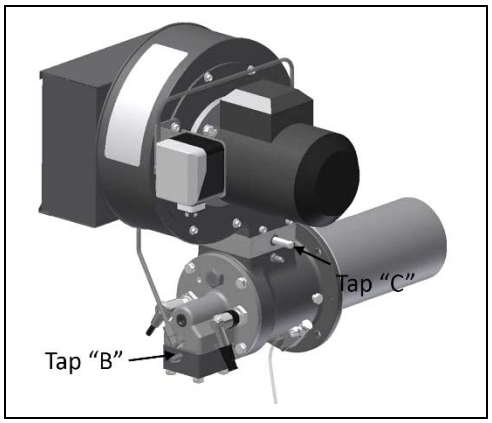


Figure 5.2

Step 4: Start-up

Start-up procedure:

1. Drive control motor to start position. The start position is approximately 10% above low fire position.
2. Ensure that the machine is ready to process the heat from the Heatpak.
3. Open the manual isolating ball valve.
4. Initiate the electrical supply to start the operating sequence. If the combustion air blower is remotely controlled, ensure that the blower is running. Under control of the burner programmer, ignition should be accomplished. If the burner does not light the first time it will be necessary to reset the burner programmer.
5. If the burner does not ignite:
   a. Attempt to ignite the burner again to purge air from the gas piping.
   b. If the burner still does not ignite, set the start position of the control motor slightly higher.
   c. Attempt to ignite burner.
   d. Repeat steps b and c until burner ignites. If necessary, refer to Section 6 for trouble-shooting tips. The burner has now started at the increased start position. The flame should just come out of the combustor. If not increase gas flow until the flame is visible.
6. Set the temperature controller to manual and set the burner control motor to low fire position. If the burners goes to flame failure increase the low fire cam slighty.

NOTE: If viewing the flame at low fire through the peepsight, it should be blue with flashes of yellow. The flame should be completely within the combustion tube. When firing propane or butane, a proper low fire flame may have sustained flashes of yellow.

7. Verify high fire flame:
   a. Drive the control motor to high fire and measure the gas pressure on tap "B".
   b. In the burner capacity must be limited to serve the process, this can be done by the high fire cam on the control motor.
8. Verify burner settings:
   a. Shut off gas. When chamber temperature is below 120°C, shut off combustion air blower.
   b. Restart burner.
   c. Verify repeatability of ignition and low fire flame signal.

Step 5: Operating checks

1. Simulate a flame out condition by closing the manual inlet ball valve. Run the ignition cycle again.
2. Check high gas pressure switch for correct operation by reducing the set point until it trips. The burner must be at high fire. Re-set to the original setting and run the ignition cycle again.
3. Check the combustion air pressure switch for correct operation by increasing the set point until it trips. Re-set to the original setting and run the ignition cycle again.
4. Measure and record the gas and air differential pressure and flame signal at low and high fire for future reference.

Gas pressure to be measured at tap B (see figure 5.2).

⚠ CAUTION

- **Do not turn the combustion air blower off until the chamber temperature is below 120°C. This will prevent hot gases from flowing back through the burner and the blower and causing damage to the burner.**

TABLE 1. **BURNER OPERATING DATA FOR RAHP**
Gas & Air data

		RAHP20.040		RAHP20.075		RAHP20.100		RAHP20.200		RAHP20.300	
	Tube	**Straight**	**MV**	**Straight**	**MV**	**Straight**	**MV**	**Straight**	**MV**	**Straight**	**MV**
Low fire data											
Capacity	kW	9	9	9	9	10	10	15	15	20	20
Pair (tap C) *	mbar	0.6	0.6	0.3	0.3	0.5	0.5	0.5	0.5	0.8	0.8
High fire data											
Capacity (nett)	kW	110	100	250	200	300	250	650	600	900	800
Pair (tap C or A) *2	mbar	16	16	6.5	6.5	10.5	16.5	20	22	24	24
NG type H											
Pgas (tap B) *2	mbar	13.5	14.1	5	5	8.5	8.5	19	21	18	18
orifice diameter	mm	10.0	10.6	18	19	18.5	18.5	23	23	25	25
Propane											
Pgas (tap B) *2	mbar	14.0	14.0	5	5	8.5	8.5	16	16	18	18
orifice diameter	mm	8.3	8.2	14	14	14.5	14.5	18.5	18.5	20.5	21
Butane											
Pgas (tap B) *2	mbar	13.7	13.7	5	5	8.5	8.5	16	16	18	18
orifice diameter	mm	7.6	7.9	13	13.5	13.0	13.0	17.0	17.5	19	20
Pgas minimum at valve train *3	mbar	50	50	50	50	50	50	50	50	50	50
Pressure switch settings											
Maximum gas	mbar	20	20	10	10	15	15	25	25	25	25
Minimum gas	mbar	35	35	35	35	40	40	40	40	40	40
Minimum air	mbar	10	10	3	3	7.5	7.5	12	12	17.5	17.5

TABLE 2. **BURNER OPERATING DATA FOR RMHP**
Gas & Air data

		RMHP30.075	RMHP30.100	RMHP30.200	RMHP30.300	RMHP30.400
Low fire data						
Capacity	kW	9	15	20	35	50
Pair (tap C)	mbar	0.1	0.15	0.3	0.3	0.3
High fire data						
Capacity (nett)	kW	200	350	500	750	1100
Pair (tap C or A) *2	mbar	9.0	11.0	16.0	22.0	21.0
NG type H						
Pgas (tap B) *2	mbar	8.5	10.0	15.5	21.0	20.0
orifice diameter	mm	19.0	29.0	29.0	30.0	36.0
Propane						
Pgas (tap B) *2	mbar	7.0	9.5	15.5	17.5	20.0
orifice diameter	mm	14.0	22.5	22.5	24.5	30.0
Butane						
Pgas (tap B) *2	mbar	7.0	8.5	14.5	17.5	20.0
orifice diameter	mm	12.7	19.0	19.0	21	25.0
Pgas minimum at valve train *3	mbar	25	50	55	65	75
Pressure switch settings						
Maximum gas	mbar	12	15	22	22	26
Minimum gas	mbar	40	40	40	40	40
Minimum air	mbar	3	6	8	11	15

TABLE 3. **BURNER OPERATING DATA FOR TAHP**
Gas & Air data

		TAHP10.040	TAHP10.075	TAHP10.100	TAHP10.200	TAHP10.300	TAHP10.400
Low fire data							
Capacity	kW	2	5	8	20	30	40
High fire data							
Capacity (nett)	kW	100	200	264	545	900	1045
Pair (tap C or A) *2	mbar	17	7	16	25	25	25
NG type H							
Pgas (tap B)	mbar	8	5	15	20	19	15
orifice diameter	mm	10.6	14	15.0	20.5	24.0	30.0
Propane							
Pgas (tap B)	mbar	16	4.5	15	19	16	15
orifice diameter	mm	7.2	11.3	11.5	16.0	20.0	24.0
Butane							
Pgas (tap B)	mbar	14	5.5	15	17	15	14
orifice diameter	mm	6.7	10.8	10.5	15.0	19.0	22.5
Pgas minimum at valve train	mbar	50	50	50	50	50	50
Pressure switch settings							
Maximum gas	mbar	14	10	19	27	24	19
Minimum gas	mbar	40	40	40	40	40	40
Minimum air	mbar	10	3	10	15	15	10

Capacities based on gross caloric values and following gas data measured at approx. 288K gas temperature and 1013 mbar atmospheric pressure:

Natural gas L: 31-37 MJ/Nm3d=0.6
Natural gas H:37-45 MJ/Nm3d=0.6
Propane:88-96 MJ/Nm3d=1.5
Butane:96-126 MJ/Nm3d=2.0

*1 -maximum deviation -0.05 / +0.1 mbar
*2 -maximum deviation +/- 1 mbar
*3 -based on natural gas type L

Filter will result in a little lower high fire capacities and related gas / air pressures
(max. -1 mbar at high fire with clean filter)

Maintenance and Troubleshooting

6

This chapter is divided into two sections:

- Maintenance procedures
- Troubleshooting guide

Maintenance

Preventive maintenance is the key to a reliable, safe and efficient system. The core of any preventive maintenance system is a list of periodic tasks.

NOTE: These are guidelines only. The customer should make the final judgment on maintenance intervals and tasks to be performed while considering the working environment.

Monthly Checklist

1. Inspect flame sensing devices for good condition and cleanliness.
2. Check for proper air/gas pressures (Refer to the operational data).
3. Test all the system alarms for proper response signals. Check and clean igniter electrodes.
4. Check the air control valve for smooth, trouble free operation and adjustment.
5. Check for the proper operation of ventilating equipment.
6. Test the interlock sequence on all safety equipment. Manually force each interlock to intentionally fail while at the same time noting if related equipment closes or stops as specified by the manufacturer.
7. Test the flame safeguard by manually shutting off the gas to the burner.
8. Test the manual gas shut off cocks for proper operation.
9. Clean and/or replace the combustion air blower filter.
10. Inspect and clean the combustion air blower rotor.

Annual Checklist

1. Leak test the safety shut-off valves for tightness of closure.
2. Test the pressure switch settings by checking the switch movements against pressure settings and comparing these with the actual impulse pressure.
3. Visually check igniter cable and connectors.
4. Inspect impulse piping for leaks.
5. Remove, clean, and inspect all burners.
6. Be sure the following components are not damaged or distorted:
   - the burner nozzle
   - the igniter
   - the flame sensors
   - the combustion tube or block

The nozzle and combustion tube/block can be inspected without removing the burner from the chamber wall or entering the chamber. Perform the following:

a. Shut the burner off and manually close the main gas shut off cocks.

b. Allow the chamber temperature to cool down to 250°F (121°C).

c. Disconnect the gas piping at a union or the gas inlet flange provided on the burner.

d. Remove the four bolts.

e. Remove the rear cover with insert from the burner housing.

f. To re-assemble, follow this sequence in the reverse order.

Troubleshooting Procedures

Problem	Possible Cause	Solution
Burner sequence starts but locks out before ignition.	Combustion air fault •Blower failure	Check blower and remedy fault.
	Combustion air fault •Blocked blower inlet or filter	Clean inlet. Clean or replace filter
	Combustion air fault •Pressure switch failure	Check pressure switch and replace if necessary
Burner start up sequence runs but does not light.	No ignition: •There is no power to the ignition transformer.	Restore power to the ignition transformer.
	No ignition: •Open circuit between the ignition transformer and the ignition electrode.	Repair or replace wiring to the ignition electrode.
	No ignition: •The ignition electrode needs cleaning.	Clean the ignition electrode.
	No ignition: •The ignition electrode is not properly grounded to the burner.	Clean the threads on the ignition electrode and the burner.
	No ignition: •Ignition electrode insulator is broken.	Inspect the ignition electrode and replace if broken.
	Not enough gas: •The gas pressure into the MultiBloc valve is too low.	Check for sufficient gas pressure.
	Not enough gas: •MultiBloc gas valve not opening.	Check wiring to the MultiBloc valve. Check the output from the burner programmer. Open manual ball valve. Replace coil if necessary.
	Not enough gas: •The ignition load setting is too low.	Increase ignition load setting.
	Not enough gas: •MultiBloc low fire setting too low or too high.	Adjust MuliBloc valve outlet pressure
	Too much gas •Wrong or missing burner fuel orifice	Check attached burner data for correct orifice.

Problem	Possible Cause	Solution
Burner lights and then goes to lock-out.	No flame signal: •Broken flame rod •Dirty UV scanner lens	Measure flame signal. Inspect and clean sensor. Replace if necessary.
	No flame signal: •Ignition electrode and flame rod connections reversed.	Exchange spark electrode/flame rod wiring.
The high fire flame is large and yellow. Burner is unstable or produces soot, smoke or excessive carbon monoxide.	Gas / air ratio out of adjustment •Burner nozzle blocked •Blocked loading line •Wrong or missing burner fuel orifice	Clean nozzle Check / clean loading line Check attached burner data for correct orifice.
	Gas pressure too high: •MultiBloc valve pressure adjustment set too high.	Adjust MultiBloc valve low fire setting
The low fire flame is week and unstable.	•Insufficient gas flow to the burner.	Adjust the low fire setting on the MultiBloc.
	•Not enough air	Clean or replace filter. Check blower rotation Compensate for chamber pressure by opening the low fire air BV position
Cannot initiate a start-up sequence.	•Combustion air pressure switch has not made “No air” contact.	Check air pressure switch adjustment. (See par. 5 step 1) Check air filter if fitted. Check blower rotation. Check outlet pressure from blower.
	•External interlock failure	Check all external interlocks.
	•Malfunction of the burner programmer. •No power supply to the burner programmer.	Have a qualified electrician troubleshoot and correct the problem.
Burner does not reach its specified capacity	Not enough air •Air BV does not open. •Blower running in reverse. •Inlet or filter blocked.	Check air control motor limit settings. Check and correct blower wiring. Clean inlet or filter. Replace filter if necessary.
	Not enough gas (air is OK) •Gas pressure into the MultiBloc is too low	Check for sufficient gas pressure.

Notes

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