



WARNING: Cancer and Reproductive Harm – www.P65Warnings.ca.gov.

Table of contents

General information2
 How your heat pump works2

System operation2
 Heating cycle2
 Cooling cycle2

Maximizing operating efficiency2
 Heating conservation2
 Cooling conservation2

Maintenance3
 Motor lubrication3
 Filter care3
 Air filters3
 Registers5
 Condenser coil5
 Blower assembly5

Characteristics of heat pumps5
 Constant heat5
 Water run-off5
 Outdoor coil defrosting5

Troubleshooting5
 Installation information6

User's, Maintenance and Service Information Manual

3 Thru 20 Ton Single Package Heat Pump Units

The manufacturer recommends that the "User" read all sections of this manual and keep the manual for future reference.

Congratulations...

on your purchase of our heat pump. This high efficiency air handling system has been precision engineered, manufactured of high quality materials, and passed many rigorous tests and inspections to ensure years of satisfactory service.

Read this booklet thoroughly. It will help you understand your heat pump. It explains how to operate your heat pump efficiently and how to obtain the greatest measure of comfort at the lowest operating expense. We appreciate your interest in our products and your decision to purchase our heat pump. Enjoy your comfort.

This heat pump has been specially developed and built to meet dual needs of heating and cooling. That's why you can rely on efficient, trouble-free operation.

Your system is fully automatic. Set the thermostat and forget it. It is also automatically protected against damage by voltage fluctuations or excessive heating or cooling demands.

General information

How your heat pump works

Cooling cycle

If your hand is wet and you blow on it, it feels cool because some of the moisture is evaporating and becoming a vapor. This process requires heat. The heat is being taken from your hand, so your hand feels cool. That's what happens with a heat pump. During the cooling cycle, the system removes heat and humidity from the indoor space and transfers this heat to the outdoor air.

Heating cycle

During the heating cycle, the system removes heat and humidity from the outdoor air and transfers this heat to the indoor space. This is possible because even 0°F outdoor air contains a great deal of heat. Remember that the heat pump doesn't generate much heat, it merely transfers it from one place to another.

System operation

The thermostat puts full control of the comfort level in the indoor space at your fingertips. Set your thermostat for either heating or cooling then set it for the required temperature.

IMPORTANT: Do not move the thermostat rapidly on and off, or from heat to cool. This could damage your equipment.

Always allow at least 5 minutes between changes. Find the temperature that is most comfortable to you and then do not change the thermostat setting.

Manually moving the thermostat up or down does not speed up temperature changes. Avoid moving the thermostat up during heating - particularly where a demand type electric meter is installed. This increases your operating cost substantially.

CAUTION

The Main power to the system must be kept On at all times to prevent damage to the outdoor unit compressor. If necessary, use the thermostat control switch to turn the system Off. If the main power is disconnected or interrupted for 8 hours or longer, DO NOT attempt to start the system for 8 hours after the power has been restored to the outdoor unit. If heat is needed during this 8 hour period, use emergency heat.

Heating cycle

With the thermostat in the heating position, and outdoor temperature in the range of 20 - 30°F or below, the outdoor unit generally runs 100% of time.

If the outdoor air is cool and moist, frost may form on the surface of the outdoor coil. When the frost builds to a certain point, the system switches to a defrost cycle. Although you may feel cooler air coming from your registers, do not adjust your thermostat. This frost will melt quickly, and the system will return to normal operation automatically.

Cooling cycle

Switch the thermostat to cool. Select a comfortable thermostat temperature setting, typically between 75 and 80°F. Comfort sensations vary with individuals. The lower the indoor temperature required, the greater the number of hours the unit must operate.

Set the thermostat 2 or 3°F below normal several hours before entertaining large groups during hot weather. People give off considerable heat and moisture.

On an extremely hot day, the indoor temperature may rise 3 to 6°F above the thermostat setting. Properly selected equipment does not have the capacity to maintain a constant indoor temperature during this peak load. Over-sizing your system to handle this peak load is not practical because an over-sized system operates much less efficiently at all other conditions.

Maximizing operating efficiency

Heating conservation

For the most efficient operation, keep storm windows and doors closed all year long. They not only help to insulate against heat and cold, but they also keep out dirt, pollen, and noise.

Close drapes at night and keep fire place dampers closed when necessary. This helps retain the air that you have already paid to heat.

Cooling conservation

To comfortably cool the space, the heat pump must remove both heat and humidity. Don't turn off the system when you

are away all day. On a hot day, the system may have to operate between 8 and 12 hours to reduce the temperature in the indoor space to a normal comfort level.

Keep windows closed after sundown. While the outdoor temperature at night may be lower than indoors, the air is generally loaded with moisture that is soaked up by furniture, carpets, and fabrics. This moisture must be removed when you restart the system.

The hotter the outside temperature, the greater the load on your system. Therefore do not be alarmed when the system continues to run after the sun has set on a hot day. Heat is stored in the outside walls during the day and continues to flow into the indoor space for several hours after sunset.

Maintenance



Prior to any of the following maintenance procedures, shut off all power to the unit.

In order to insure long and trouble free service from your system, we recommend periodic inspection, cleaning, lubrication, and adjustment by your installing dealer or contractor. Be sure to ask about this service.

For buildings with in-house maintenance, follow the instructions listed below to care for your system.

Motor lubrication

Both the indoor blower motor and outdoor fan motor are permanently lubricated and require no maintenance.

Filter care

Filters must always be used and must be kept clean. When filters become dirt laden, insufficient air will be delivered by the blower, decreasing your units efficiency and increasing operating costs and wear-and-tear on the unit and controls.

Air filters

3 thru 6 ton units

3 to 6 ton units are shipped with 1-inch throwaway air filters. The filter racks on 3 to 6 ton units receive 1-inch or 2-inch filters. Filters can also be installed in the building at a suitable return air location if an economizer or outside air accessory is not used.

NOTE: Do not operate the unit without a filter.

Inspect filters once a month. Thoroughly clean the filters or replace them if it appears that they are beginning to accumulate excessive dirt. Table 1 shows filter sizes and quantities.

Table 1: Filter sizes 3 thru 6 ton units

Throwaway filter sizes (inches)	Quantity per unit (nom, tons)
	3 - 6 ton
14 x 20	2
14 x 25	1

Installing air filters

1. Remove the filter access panel located to the left of the condensate drain connection. See Figure 1.

NOTE: Install the filters with the Air Flow arrows pointing inward towards the indoor coil. In the event the spacers in the filter section are removed, they must be reinstalled in their original position.

2. Slide the filters all the way into the filter racks provided. When more than one filter in a filter rack is required, they must butt each other when you slide them into position.
3. Replace the filter access panel.

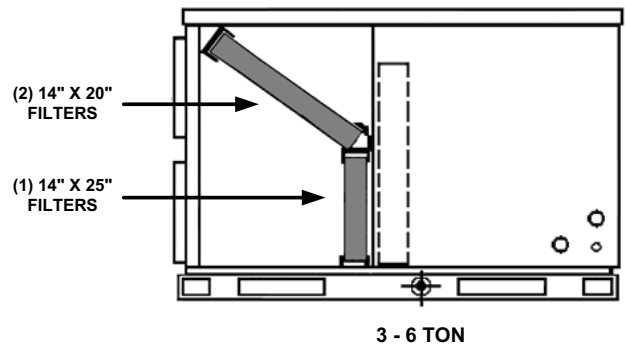


Figure 1 - End view less filter access panel 3 thru 6 ton

3 thru 12.5 ton units

All units contain four filters. The filter racks on 3 to 12.5 ton units receive either 1-inch or 2-inch filters. Filters can also be installed in the building at a suitable return air location if an economizer or outside air accessory is not used.

NOTE: Do not operate the unit without a filter.

Inspect filters once a month. Thoroughly clean the filters or replace them if it appears that they are beginning to accumulate excessive dirt.

Installing air filters

1. Remove the filter access panel, see Figure 2.

NOTE: Install the filters with the Air Flow arrows pointing inward towards the indoor coil. In the event the spacers in the filter section are removed, they must be reinstalled in their original position.

2. Slide the filters all the way into the filter racks provided. When more than one filter in a filter rack is required, they must butt each other when you slide them into position.
3. Replace the filter access panel.

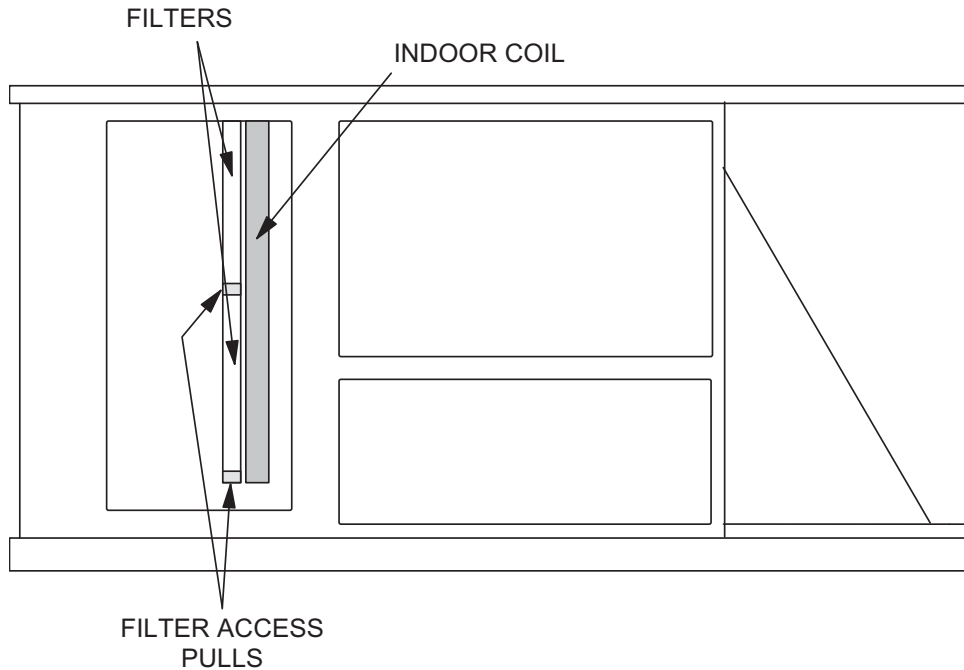


Figure 2- Filter access 3 thru 12.5 ton units

15 and 20 ton units

All units contain 2-inch filters. Filters can be installed in the building at a suitable return air location if an economizer or outside air accessory is not used.

NOTE: Do not operate the unit without a filter.

Inspect filters once a month. Thoroughly clean the filters or replace them if it appears that they are beginning to accumulate excessive dirt. Table 2 shows filter sizes and quantities.

Table 2: .Filter sizes 15 and 20 ton units

Throwaway filter sizes (Inches)	Quantity per unit (nom, tons)	
	15 ton	20 ton
12 x 24	-	12
16x 20	4	-
16 x 25	4	-

Installing air filters

1. Remove the filter access panel located to the left of the condensate drain connection. See Figure 3.

NOTE: Install the filters with the Air Flow arrows pointing inward towards the indoor coil. In the event the spacers in the filter section are removed, they must be reinstalled in their original position.

2. Slide the filters all the way into the filter racks provided. When more than one filter in a filter rack is required, they must butt each other when you slide them into position.
3. Replace the filter access panel.

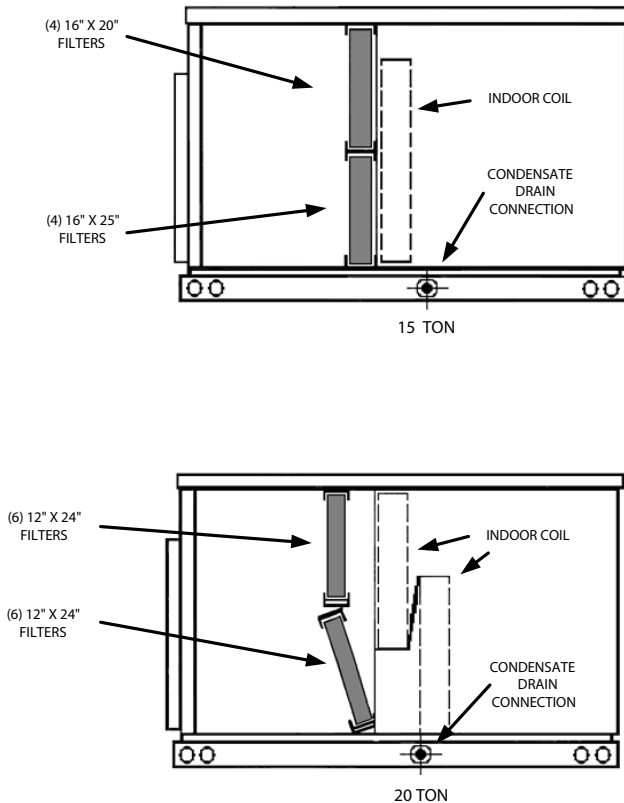


Figure 3 - End view less filter access panel 15 and 20 ton units

Registers

Supply and return air registers must be open when the unit is in operation. Make sure that obstructions do not block the air-flow in or out of the registers.

Condenser coil

Check the outdoor coil annually. Clean the coil as often as necessary to keep the coil clean. Clean any debris and dirt from the outside coil face with a brush being careful not to damage the fins. If the coil is extremely dirty, you can use a hose to wash the coil from the inside out. You can brush a soapy solution on the outside.

Blower assembly

Even with good filters properly in place, blower wheels and motors can become dust laden after many months of operation. Inspect the entire blower assembly annually. If the motor and wheel are heavily coated with dust, you can brush and clean them with a vacuum cleaner.

Characteristics of heat pumps

Constant heat

Heat pumps have a noticeably cooler supply air temperature than furnaces. The common practice of over-sizing furnaces contributes to an off-and-on-again operation with short blasts of hot supply air. The heat pump system is sized more closely to the heating needs of your indoor space. Heat is supplied at a lower temperature over a longer period of time to provide a more constant heat and it may give you the impression that the system never stops running.

Water run-off

During the heating cycle, you may notice water running off the outdoor coil. Moisture from the air is condensed on the outside surface of the coil where it gathers and runs off. No need for alarm, the unit has not sprung a leak.

Outdoor coil defrosting

At certain outdoor conditions (low temperature, high humidity), frost may build up on the coil of the outdoor unit. In order to maintain heating efficiency, the system automatically defrosts itself.

Water vapor rising from the outdoor unit is normal and is an indication of proper operation. The vapor cloud only lasts for a few minutes. When the defrost cycle is completed, the system automatically switches back to heating. Electric heat is automatically energized to maintain comfort during defrost.

Troubleshooting

Before you call a service person, complete the following checks.

- Check the thermostat settings and insure that the thermostat is calling for heat or cooling.
- Check the thermostat for lint.
- Check the fuses or circuit breakers.
- Check the filters for excessive dust accumulation.

In the event of power outages, complete the steps in the following sections.

Heating season

1. Switch the thermostat to Emergency Heat. Heat will not be available until the power is re-established.
2. Leave on Emergency Heat for at least 12 hours after electrical power is re-established.
3. Switch the thermostat back to Heating or Auto.

Cooling season

1. Switch the thermostat to the Off position.
2. Four hours after the power is re-established, switch to Cooling or Auto.

Table 3 outlines troubleshooting actions. If the solutions do not resolve the condition, call a qualified service person.

Table 3: Troubleshooting guide

Condition	Cause	Solution
There is no heat or cooling.	The thermostat settings are incorrect.	Set the thermostat to the proper setting.
	The circuit breakers or fuses are not functioning.	Reset the circuit breakers. Replace blown fuses.
	The unit has a dirty filter.	Clean or replace the filter.
There is not enough heat. The outdoor unit is not running.		Check the other causes. Switch the thermostat to the Emergency Heat position.

Installation information

OWNER please have your installer fill in the following information immediately after unit has been installed and is properly operating.

Installed by _____

Installer's Address _____

Installation Date _____

Owner's Name _____

Owner's Address _____

Equipment installed at (address) _____

Model Number _____ Serial Number _____

Distributor from whom the equipment was purchased _____

The owner should keep this information in a place where it can be found if needed for warranty purposes.



Subject to change without notice. Printed in U.S.A.
Copyright © 2018 by Ducted Systems. All rights reserved.

820900-UUM-B-0718
Supersedes: 820900-UUM-A-1011

York International Corporation
5005 York Drive
Norman, OK 73069