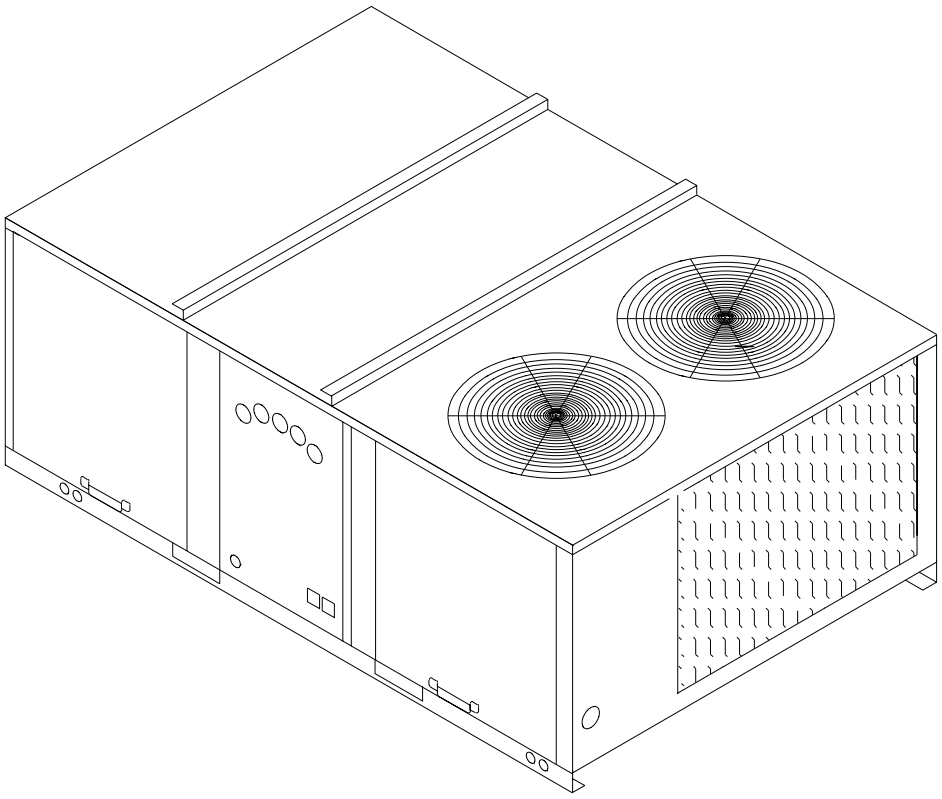
INSTALLATION OPERATION MAINTENANCE

<u>Customer Property</u> — Contains wiring, service, and operation information. Please retain.

Library	Service Literature
Product Section	Unitary
Product	Rooftop Lt. Comm.
Model	YK
Literature Type	Installation/ Oper/ Maint
Sequence	2
Date	November 2000
File No.	SV-UN-RT-YK-IOM-2 11/00
Supersedes	New

Models: **(50 Hz)**
YK*085-250

Voyager ™
Packaged Gas/Electric
085 thru 250 Units



IMPORTANT NOTE: All phases of this installation must comply with the **NATIONAL & LOCAL CODES.**. These units are equipped with an electronic unit control processor, (UCP) that provides service functions which are significantly different from conventional units. Refer to the TEST MODES and START-UP PROCEDURES before attempting to operate or perform maintenance on this unit.

Table of Contents

Read this manual carefully before attempting to install, operate or perform maintenance on this unit. Installation and maintenance must be performed by qualified service technicians except where noted.

⚠WARNING: ***Bodily injury can result from high voltage electrical components, fast moving fan drives and combustible gas. For protection from these inherent hazards during installation and servicing, the electrical supply must be disconnected and the main gas valve must be turned off. If operating checks must be performed with the unit operating, it is the technician's responsibility to recognize these hazards and proceed safely.***

IMPORTANT: This unit, as shipped from the factory, is designed to use natural gas only. Do not connect gas piping to the unit until a line pressure test has been completed. Pressure in excess of 34.8 mbar (14" water column (1/2 PSIG) may damage the gas valve resulting in an unsafe condition.

⚠WARNING: All power legs to the electrical components may not be broken by contactors. See the wiring diagram on the unit control box cover.

Before starting the compressor, the crankcase heaters should be energized for eight hours.

Exception - Both circuits on the125 thru 250 units are not equipped with crankcase heaters.

Note: "Warnings" and "Cautions" appear at appropriate places in this manual. Your personal safety and the proper operation of this machine require that you follow them carefully. The manufacturer assumes no liability for installations or servicing performed by unqualified personnel.

Inspection

1. Check for damage after unit is unloaded. Report promptly, to the carrier, any damage found to unit. Do not drop unit.

2. Check unit nameplate to determine if unit is correct for application intended. Power supply must be adequate for the unit and all accessories.

3. Check to be sure the refrigerant charge has been retained during shipment. Access to 1/4" flare pressure taps may be gained by removing compressor compartment access panel.

MODULE NAMES

UCP - Unitary Control Processor (standard component) This is the heart of the system. The computer program resides in this module. The minimum configuration will include the **UCP** and one of the zone sensor modules

ZSM - Zone Sensor Module (accessory component) Replaces thermostat, provides operator controls and the zone temperature sensor for the **UCP** . A complete line of **ZSMs** is available with various combinations of features. A zone sensor module, or a CTI and generic control is required for each system.

UEM - Unitary Economizer Module (standard component on economizer accessory). This module provides the hardware necessary to connect the economizer accessory to the **UCP**.

TCI - Communication Interface. This interface is required to connect the system to an ICS BUILDING MANAGEMENT, i.e. - Tracker or Tracer. system.

CTI - Conventional Thermostat Interface. This module can be used in special applications that require the installation of select electro-mechanical thermostats to interface with the **UCP**, instead of using a zone sensor module (**ZSM**)

UNIT FEATURES

Self-test/Auto-configuration
At power-up, the system will perform a series of tests to verify correct operation and configure itself automatically, based on the unit wiring harness.

Cooling Minimum ON/OFF times
To enhance compressor reliability, a minimum of 3 minutes ON/OFF time has been implemented in the software. Any time power is applied or re-applied (e.g. after a power failure), the 3 minutes minimum OFF time is enforced to prevent short cycling a compressor.

Lead-Lag
A selectable configuration within the UCP which alternates the starting of the compressors between the two refrigeration circuits. To enable the Lead/Lag function, cut wire 52F (PR) which is connected to terminal J1-7 at the UCP. Refer to the unit wiring diagram. Each time the request for cooling is satisfied, the disignated lead compressor switches. Upon Power-up Initialization, the control will default to the number one compressor. When a Conventional Thermostat Interface (CTI) is used, Lead/Lag is functional except during the test mode.

Zone Temperature Sensor
The zone temperature sensor provides the zone temperature sensing function to the **UCP**.

Ignition Control Module
There are two LED's located in the Ignition Control Module that monitor the operating status of the heater during the various operating states and sets diagnostics should a failure occur.

ZSM MODE

HEAT - Heat functions only enabled.

AUTO - Auto-changeover between Cooling mode and Heating mode as required by zone load. (On some models)

OFF - No heating or cooling functions

COOL - Cooling functions only, including economizer function enabled.

FAN SETTINGS

FAN AUTO - Fan is enabled only when heating or cooling functions are required.

FAN ON - Fan is enabled at all times. This setting is used when minimum ventilation is required.

Option Remote Panel Zone Sensors
Indicator Lights

SYS-ON
Indicates that power is applied to the unit and the UCP is functioning correctly. This indicator will flash at a 1 second rate to indicate operation of one of the test modes.

HEAT
Indicates that at least one stage of heat is ON. This indicator will flash at a 1 second rate to indicate a heat failure when limit **TCO1** and/or **TCO2** has tripped.

COOL
Indicates that cooling is active. This could be economizing and/or compressor cooling. This indicator will flash at a 1 second rate to indicate a cool failure. Sources of cool failure include high pressure controls if present and zone sensor failures.

SERVICE
Indicates that a problem exists in the supply air stream. Could be dirty filters, broken drive belt or other functions depending on what sensors or switches are installed on the fan/filter status input.

TEST MODE PROCEDURE

Operating the unit from the roof using the test mode.

⚠WARNING: ***When operating the unit in the test mode, the evaporator access panel and the control box cover, must be closed. Failure to ensure that the evaporator access panel and control box cover is in place could result in severe personal injury or death***

The Unitary Control Processor **(UCP)** has a red indicator light in the lower left corner. When power is applied to the unit the light will glow if the **UCP** is functioning correctly. If the system is placed in the test mode the light will blink continuously.

Note: The control box cover has a small peep hole, located in the lower left hand corner. The red indicator light on the UCP can be seen through this peep hole. Do not remove the control box cover while the unit power is connected.

Step Test Mode

The step test mode is initiated by shorting across the “TEST” terminals, marked test 1 and test 2 on the unit’s low voltage terminal strip **(LTB)**, for two (2) to three (3) seconds and then removing the short.

When the test mode is initiated, the light on the **UCP** will blink and the system will begin the first test step, and turn on the indoor fan. (See test mode table)

To continue to the next step, re-apply the short across the test terminals for 2 to 3 seconds.

The unit may be left in any test step for up to one hour. If allowed to remain in any test step for more than one hour, the test mode will terminate and control will revert to the zone sensor. As you continue to apply and remove the short across the test terminals, the unit will move through the steps according to the table below.

To terminate the test mode, cycle the unit power at the unit disconnect or continue stepping through the modes until the **UCP’s** indicator light glows constantly.

Auto Test Mode

— The auto test mode is initiated by installing a jumper between terminals marked TEST 1 and TEST 2 on the LTB. The unit will start in step 1 and cycle through the test steps one time, changing every 30 seconds.

— When the test mode is initiated, the light on the UCP will blink and the system will begin the first test step, and turn on the indoor fan. (See test mode table)

— At the end of the auto test mode, the indicator light will glow constantly and control will revert to the zone sensor.

— The unit can be left in any one of the test steps, by removing the jumper. It will remain in this step for up to one hour. If allowed to remain in any test step for more than one hour, the test mode will terminate and control will revert to the zone sensor.

— To terminate the test mode, cycle the unit power at the unit disconnect.

Resistance Test Mode

The resistance test mode is initiated by applying the appropriate resistance value across the “Test” terminals marked TEST 1 and TEST 2 on the **LTB**.

— When the test mode is initiated, the light on the **UCP** will blink and the system will begin the test step selected by the resistance being applied across the test terminals. (See test mode table)

— The resistance values are indicated in the Resistance Value Chart below.

— After selecting the desired test step, and applying the appropriate resistance across the test terminals, the unit will start.

— The unit can be left in this step for up to one hour. If allowed to remain in any test step for more than one hour, the test mode will terminate and control will revert to the zone sensor.

— To terminate the test mode, remove the resistance, and cycle the unit power at the unit disconnect.

Test Mode Table

Step	Mode	Fan	Econ	C1	C2	Heat 1	Heat 2	Heat 3	Defrost	Em Heat
1	Fan On	On	Min	Off	Off	Off	Off	Off	Off	Off
2*	Econ	On	Open	Off	Off	Off	Off	Off	Off	Off
3	Cool 1	On	Min	On	Off	Off	Off	Off	Off	Off
4	Cool 2	On	Min	On	On	Off	Off	Off	Off	Off
5	Heat1	On	Min	Off	Off	On	Off	Off	Off	Off
6*	Heat 2	On	Min	Off	Off	On	On	Off	Off	Off
7*	Heat 3	(Not Applicable on Electric/Electric or Gas Units)								
8**	Defrost	(Not Applicable on Electric/Electric or Gas Units)								
9**	Em Heat	(Not Applicable on Electric/Electric or Gas Units)								

* With Optional Accessory ** With Heat Pump

Note: Steps for optional accessories and modes not present in unit, will be skipped.

Resistance Valves Chart

STEP	MODE	Ohms
1	FAN ON	2.2K
2*	ECONOMIZER	3.3K
3	COOL 1	4.7K
4	COOL 2	6.8K
5	HEAT 1	10K
6*	HEAT 2	15K
7*	HEAT 3	22K
8**	DEFROST	33K
9**	EM HEAT	47K

* With Optional Accessory

** With Heat Pumps

Note: Steps 7,8 & 9 are not applicable on Electric/Electric or Gas Units

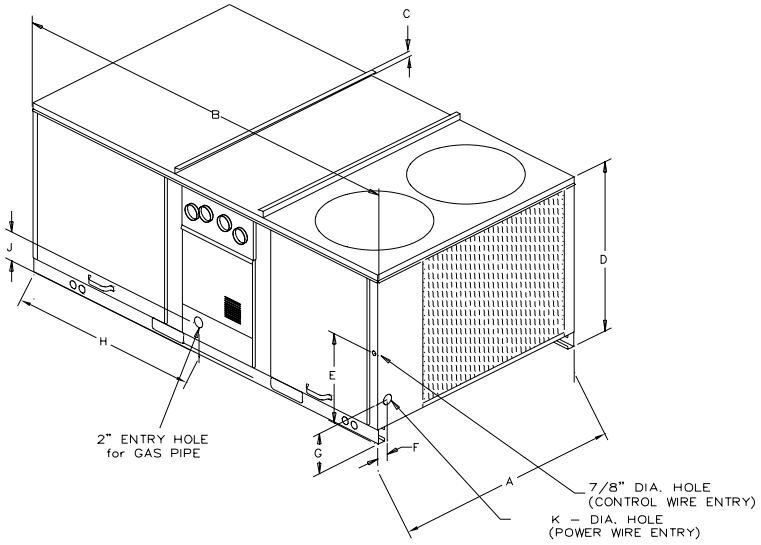
Dimensional Data

Unit Dimensions - SI - mm

UNITS	A	B	C	D	E	F	G	H	J	K
YK*085C,100C	1259	2245	NA	1153	651	47	171	1084	162	51
YK*100B, 125C	1608	2396	20	1245	727	56	213	1138	150	51
YK*155B,175C	1798	2725	20	1273	744	69	213	1448	150	51
YK*200B, 250B	2154	3106	20	1372	843	69	227	1638	150	76

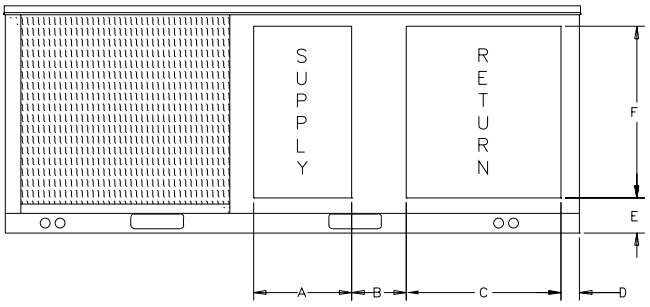
* Downflow or Horizontal

(YKD155 Illustrated)



HORIZONTAL UNIT - SI - mm
REAR VIEW SHOWING DUCT OPENINGS
FOR HORIZONTAL AIR FLOW

UNITS	A	B	C	D	E	F
YK*085C,100C	406	413	510	76	162	914
YK*100B,125C	571	457	437	51	100	1053
YK*155B,175C	673	497	624	51	100	1080
YK*200B,250B	673	611	700	51	100	1180



DOWNFLOW UNIT - SI - mm
TOP VIEW SHOWING DUCT OPENINGS IN THE BASE

UNITS	A	B	C	D	E
YK*085C,100C	386	572	329	1013	895
YK*100B,125C	570	368	449	1312	1199
YK*155B,175C	672	572	475	1586	1389
YK*200B, 250B	672	730	506	1938	1745

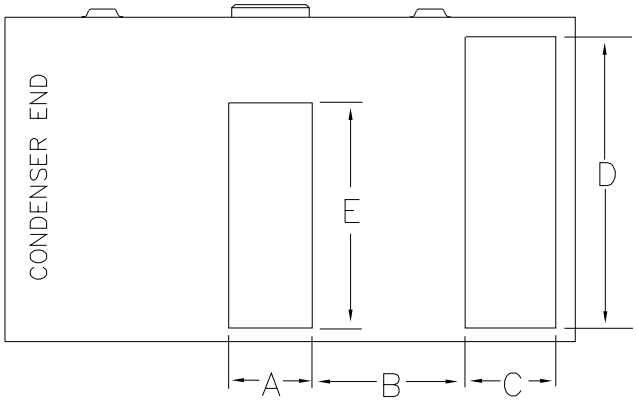


Figure 1A

Curb Dimensions - SI - mm

Figure	UNITS	A	B	C	D	E	F	G	H	J	K	L	M	N	P
1A	YK*100B, 125C	1502	1408	46	486	251	622	2259	1509	2267	51	357	25	205	1205
1A	YK*155B, 175C	1692	1600	46	530	435	724	2588	1702	2597	51	357	25	191	1410
1A	YK*200B, 250B	2048	1956	46	565	591	725	2969	2057	2977	51	357	25	191	1765

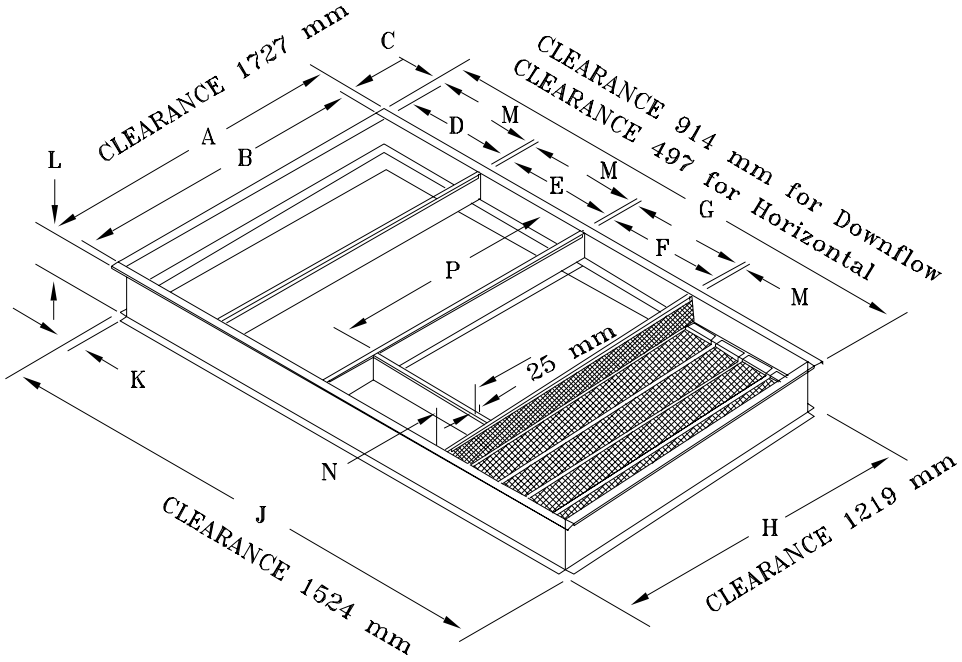
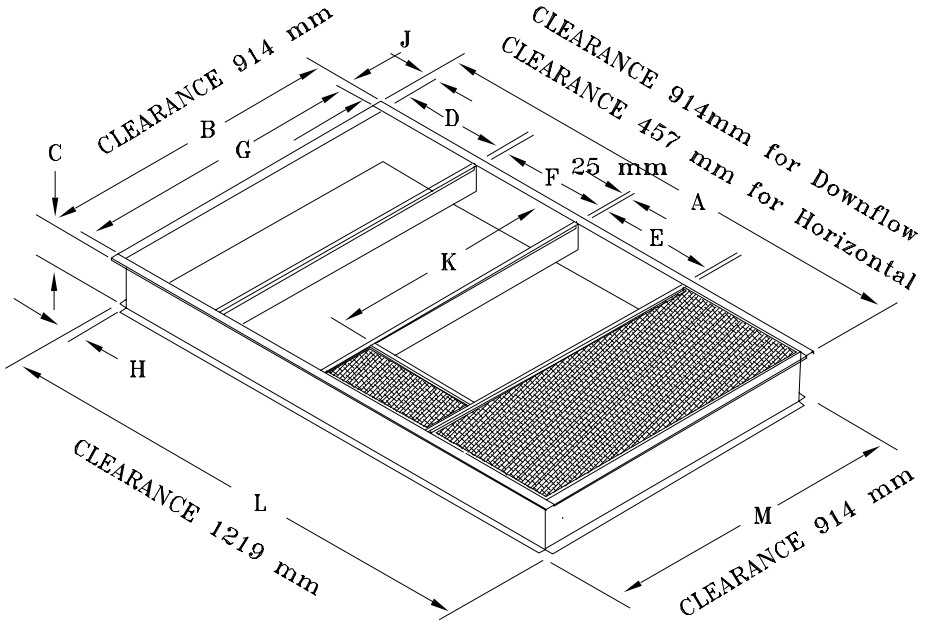


Figure 1B

Curb Dimensions - SI - mm

Figure	UNITS	A	B	C	D	E	F	G	H	J	K	L	M
1B	YK*085C, 100C	2064	1170	356	365	438	464	1076	51	46	919	2073	1178



INSTALLATION
Location and Recommendations

Unit Support

If unit is to be roof mounted check building codes for weight distribution requirements. Refer to accessory roof curb mounting instructions. Check unit nameplate for supply voltage required. Determine if adequate electrical power is available. Refer to specification sheet. Furnace may be installed on Class A, B or C roofing material.

Location and Clearances

Installation of unit should conform to national and local building codes.

Model YK heating/cooling units are designed for outdoor mounting with a vertical condenser discharge. They can be located either at ground level or on a roof, in accordance with national and local codes. Since these units are designed exclusively for outdoor operation, additional flue venting systems are not required. Each unit contains an operating charge of refrigerant as shipped.

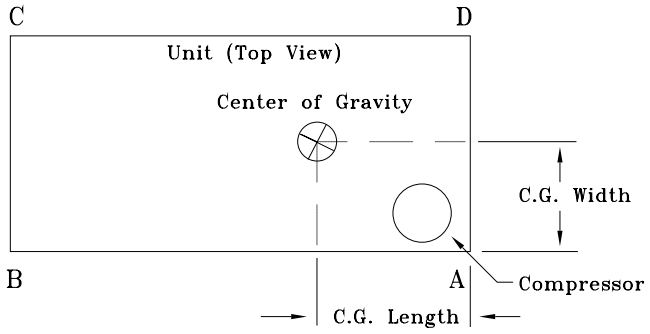
Select a location that will permit unobstructed airflow into the condenser coil and away from the fan discharge and permit unobstructed combustion airflow into the burner compartment. Suggested airflow clearances and service clearances are given in Figure 1A and 1B .

Placing and Rigging

***NOTE*: Before attempting to rig the unit, remove the fork lift pockets located on the condenser end of the unit.**

Figure 2

Rig the unit using either belt or cable slings. The sling eyelet must be placed through the lifting holes in the base rail of the



unit. The point where the slings meet the lifting eyelet should be at least 1.8m above the unit. Use spreader bars to prevent excessive pressure on the top of the unit during lifting. Figure 2 shows the unit center of gravity.

IMPORTANT: The use of "spreader bars" is required when hoisting the unit (prevents damage to sides and top). Top crating can be used as spreader bars.

Mounting Unit on Roof

Downflow units should be mounted on a roof curb when possible. When installing the unit on the roof curb, follow the installation instructions accompanying the roof curb kit. On new roofs, the curb should be welded directly to the roof deck. For existing construction, nailers must be installed under the curb if welding is not possible. Be sure to attach the downflow ductwork to the curb before setting unit in place. See Figure 3A or 3B. Refer to the curb installation instructions to insure the unit will be level.

When installing the unit, it must be level to insure proper condensate flow from the unit drain pan. The maximum pitch of the unit down from the condensate drain of the unit is **6mm per meter.**

Slab Mount

For ground level installation, the unit base should be adequately supported and hold the unit near level. The installation must meet the guidelines set forth in local codes.

Table 1

Corner weights & Center of Gravity

Unit Description	Net Weight (kg)	Corner Weights (kg)				Center of Gravity (mm)	
		A	B	C	D	Length	Width
YK*085C	437	149	111	75	101	965	508
YK*100B	566	193	150	98	125	965	635
YK*100C	447	152	114	78	103	965	508
YK*125C	590	195	155	106	134	1041	660
YK*155B	698	243	176	118	162	1143	737
YK*175C	735	251	188	127	169	1168	737
YK*200B	920	324	242	151	203	1321	838
YK*250B	946	327	251	159	208	1346	838

*Downflow or Horizontal

Note: Corner weights are given for information only. Unit is to be supported continuously by curb or equivalent frame support.

Duct Dimensions - SI - mm

Figure	UNITS	A	B	C	D	E	F	G
3A	YK*100B,125C	1308	411	1130	567	25	357	189
3A	YK*155B,175C	1510	454	1334	643	25	357	189
3A	YK*200B,250B	1865	491	1689	668	25	357	189
3B	YK*085C,100C	1048	349	905	429	38	429	NA

Figure 3A

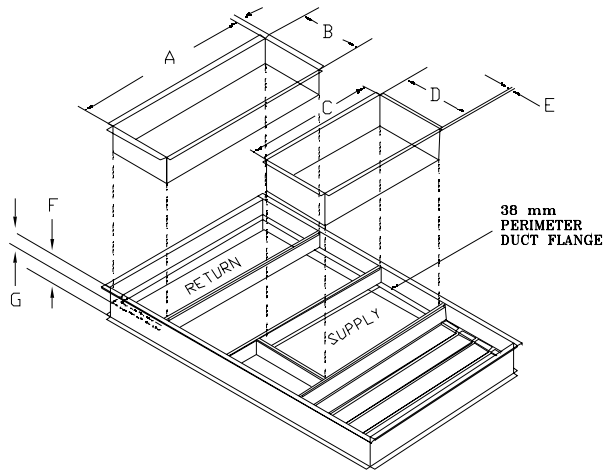
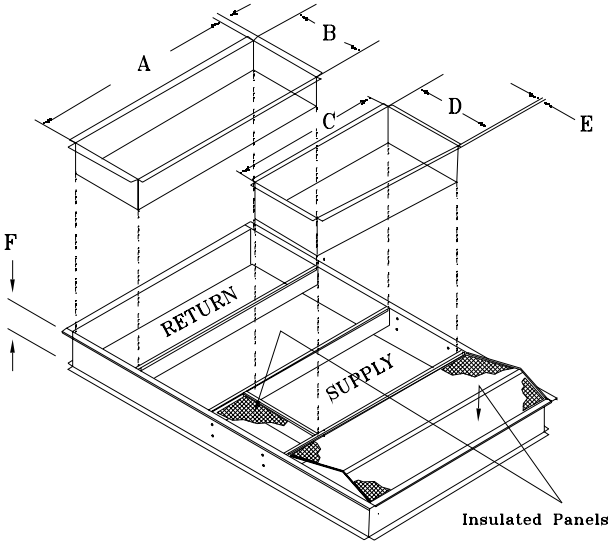


Figure 3B



Ductwork

Attaching Downflow Ductwork to Roof Curb

Supply and return openings have curb flanges provided for easy duct installation.

Note: Ductwork sleeves must be attached to the curb flanges before the unit is set into place. See Figure 3A and 3B for duct connections and dimensions.

Guidelines for ductwork construction:

— Connections to the unit should be made with three-inch canvas connectors to minimize noise and vibration transmission.

— Elbows with turning vanes or splitters are recommended to minimize air noise and resistance.

— The first elbow in the ductwork leaving the unit should be no closer than two feet from the unit, to minimize noise and resistance.

Attaching Horizontal Ductwork to Unit

— All conditioned air ductwork should be insulated to minimize heating and cooling duct losses. Use minimum of 50 mm (2") of insulation with a vapor barrier. The outside ductwork must be weather proofed between the unit and the building.

— When attaching ductwork to a horizontal unit, provide a flexible water tight connection to prevent noise transmission from the unit to the ducts.

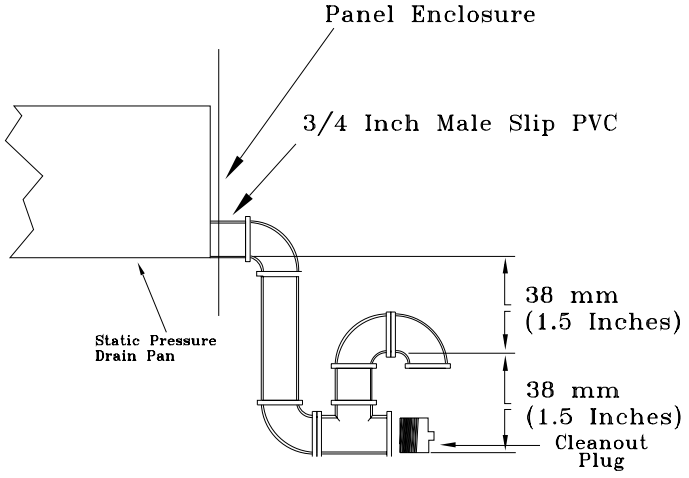
Note: **Do not draw the canvas connectors taut between the unit and ducts. See dimensional data for duct connections.**

Condensate Drain Piping

A 3/4 inch PVC condensate drain connection is provided on the YK, TK*085 - 100C units only. A 1 inch NPT female condensate drain connection is provided on all other units.

Follow local codes and standard piping practices when running the drain line. Install a trap and be sure to fill with water before starting the unit. Pitch the line downward, away from the unit; avoid long, level, horizontal runs. Refer to Figure 4.

Figure 4



Gas Pipework Installation
The installation must conform to all standards and regulations. The gas supply pipework and gas stop valve to be installed near the unit must be dimensioned so as to assure the gas pressure is sufficient at the unit inlet when operating at full load.

The pipework must be self supporting and the final connection to the burner must be made by flexible pipe. Provide a dust protection (filter) upstream of the unit connection. Look for gas pipe leaks using "Typo", "1000 bulles" or a similar product. Soapy water must not be used.

Caution: Never use an open flame to check for gas leaks. Required gas pressure at the unit inlet connection are given in Table 4.

Caution: The gas pipework must not exert any stress on the burner gas connection.

The heating system must be isolated by a gas stop valve from the gas supply pipe during the pressure test as soon as it is higher than 0.035 bar. Applying a pressure higher than 0.035 bar at the unit valve gas could damage it.

Operating Principles of the Gas Heating Module
The heating function of the YK* units is controlled by the heating module ignition burner. The burner, of the forced air type, has two capacity stages controlled by the UCP electronic controller which optimizes the air conditioner operation.

A normal call for heat is initiated by the UCP, using the temperature detected at the zone sensor. The UCP module internal relays K5 and K6 energize, which in turn energize the heat relay (H), the combustion fan motor (CFM), and the ignition control module (IGN).

The relay K5 switches CFM into high speed. After approximately 1 minute K5 switches back and the CFM changes into low speed. If the low pressure fan switch (LPGS), and the high limit cutout (TC01) are closed, ignition is allowed. The ignition control module pre-heats the ignition probe (IP) during approximately 36 seconds. After this pre-heating stage the gas valve is energized for approximately 8 seconds to ignite the burner. If the burner fails to ignite, the control module tries again twice before self-locking out. When the gas ignites successfully, the IP probe is de-energized and maintains a flame detection function.

If the zone temperature remains below the first stage heating setpoint for 90 seconds after the heating cycle has started, the UCP energizes again the K5 relay. The burner fan then switches into high speed and the heating capacity is raised to maximum.

When the temperature of the zone has reached the setpoint, the UCP de-engerizes the relays K5, K6, H and IGN; the burner then stops.

If the indoor fan is set to auto operation, it will stop 90 seconds after the burner has stopped in order to recover as much heat as possible from the exchanger.

To reset the ignition controller which has tripped on safety, it is necessary to cycle power to the unit.

Note: The supply static pressure should be checked and should be no less than 200 Pa.

In addition to the safety features of the ignition controller, the burner includes the following safeties:

- detection of a gas supply minimal pressure by the automatic reset pressure switch LPGS.

- detection of an abnormal temperature of the supply air (Thermostat TC01).

- detection of an overheating problem due to a lack of air circulation through the heat exchanger (Thermostat TC02).

Table 2 - State of LEDs on Gas-Fired Heating Module

Diagnostics	Green LED	Red LED
1. Powered without heating demand	Off	Off
2. Heating demand without fault	Flashing	Off
3. No flame detection on ignition or signal detected and then lost	Off	Flashing
4. Gas unit incorrectly wired or flame signal detected on a heating demand	On	Flashing
5. Internal fault	Off	On

Putting the Gas-Fired Heating Module into Operation (Reserved for the qualified gas technician)

⚠ CAUTION: ***This type of burner can only be put into operation by an approved techician who has read the following procedure beforehand, or preferably has undergone the training course on Trane gas burners.***

Before performing ignition tests it is first necessary to perform the following operations:

- Check if gate valve is present
- Check if an expansion valve is present. This valve must be adapted to the type of gas used:
* G 20 : 20 mb
* G 25 : 25 mb
* G 31 : 37 or 50 mb

Note: To operate with propane gas, the burner is fitted with a limiter (supplied by Trane).

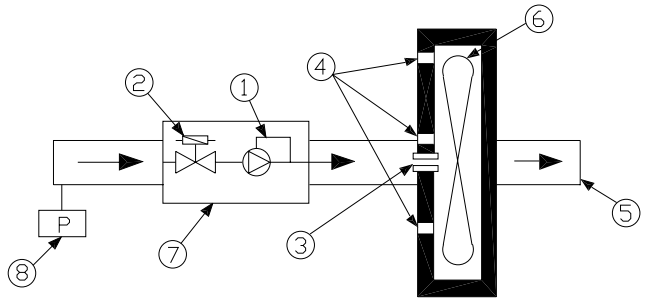
- Vent the gas line
- Check the gas pipe is leak-tight upstream of the gas unit (see drawing). Use Typol or a foaming product ("1000 bulles" aerosol or similar). Do not use soapy water.

- Check the pressure upstream of the gas unit (the pressure connection is located on the minimum gas pressure cut-out). This cut-out must be set to 15 mbar. This operation must be carried out while the burner is not operating.

- Check voltage at the TNS2 transformer output:

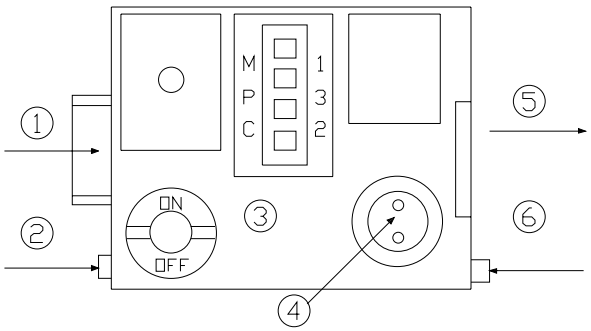
- 115 volts for power supply of the IGN module (L1 - L2 and S1 - S2).
230 volts for power supply of the burner fan motor.

Figure 5



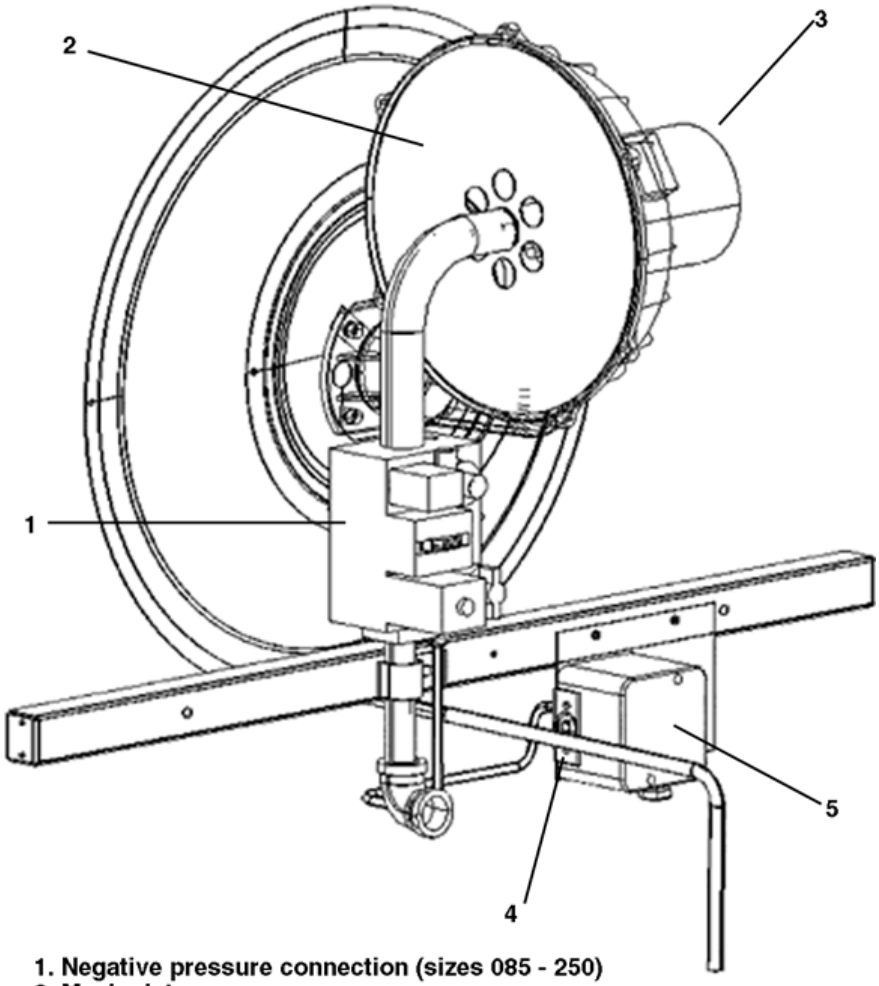
① Negative pressure control
② Safety solenoid
③ Gas injector
④ Air inlets
⑤ To the burner
⑥ Fan
⑦ Gas unit
⑧ Min. gas pressure cut-out

Figure 6



① Gas inlet
② Pressure connection
③ Gas Unit
④ Brass screw
⑤ Gas outlet
⑥ Downstream pressure connection

Detail of the Gas Section



1. Negative pressure connection (sizes 085 - 250)
2. Mesh plate
3. Fan motor unit
4. Gas pressure connection
5. Min. gas pressure cut-out

- Measure the negative pressure downstream of the gas unit. Connect a flexible hose to the gas unit branch connection and connect as electronic pressure gauge, or failing this a U tube.

- Start the burner by modifying the thermostat's set point or by using the "test mode" terninals on the machines terminal strip.

- Measure the downstream partial vacuum. It must be between - (minus) 5 mm and - (minus) 9 mm of water head.

- Check the supply pressure upstream of the gas unit once more when it is operating to ensure the pressure has not dropped.

Important note: In the event this measurement is correct, do not adjust the gas unit setting. It has been set in the factory.

When the measured partial vacuum is positive (above atmospheric pressure)
- Remove the paint mark on the brass threaded plug with two holes drilled in it, located on the gas unit, and unscrew it (See Figure 6).

- To increase the partial vacuum turn the screw counter-clockwise.

- Measure the partial vacuum again while the burner is operating.

- When the adjustment is finished, seal the brass threaded plug with paint.

It is highly recommended to check the combustion gases with a flue gas analyzer. The measured valves must be within the following ranges:
-Carbon monoxide (CO) less than 50 PPM
-Oxygen (O2) greater than 1.5%
-Carbon dioxide (CO2) less than 11%

Note: If the correct setting cannot be obtained, contact the Trane technicians.

Checking the correct operation of the burner
After having iginited the burner a few times, it is necessary to check the proper operation of the burner safeties by following the following procedure:

1. Close the main gas valve, and then simulate a demand for heating. The burner must start, and then stop when the quantity of gas contained in the pipe between the main valve and the built-in gas unit has run out. To ensure this takes place, following the drop in supply pressure, the LPGS cut-out must open and stop all the gas supply chain components (fans, gas valve, ignition controller). Any attempt to ignite the system again must fail.

2. Open the main gas valve. The pressure switch LPGS should automatically reset. The burner can now be put back into operation.

3. Ignite the burner. Once it is burning, simulate a flame failure by disconnecting a wire of the flame detection sensor (quick connect). The ignition controller should immediately stop the burner and close the gas valve.

4. Reconnect the sensor and re-ignite the burner. Once the burner is ignited, simulate a high temperature failure by disconnecting a wire from the sensor TC01. The gas valve should close and stop the flaem, re-connect TC01. The ignition sequence will be initiated. The burner should re-light after about 45 seconds.

5. Once the burner is ignited, simulate overheating by disconnecting a wire from the sensor TC02. This stops all the burner's elements (fan and gas valve should no longer be energized). Reconnect the TC02 wire.

Adaption to available gases (See Table 3)
The gas-fired heating modules built into YK* units are available in different categories. The units are supplied ready to operate using natural gases G20 (20 mbar) and G25 (25 mbar) or using gas G31 (37 mbar).

The transition from G20 gas to G25 gas does not require any action. The available power in G25 gas supply is reduced.

The transition from G20 to G31 gas requires the following modifications.
- Change of the gas intake orifice in the burner's fan.
- Implementation of pressure limiter.

⚠ WARNING: The orifice and the limiter for supply with gas G31 must be manufactured by Trane.

.
Start up
Operating check list before the start-up
- Unit is level, with sufficient clearance all around.
- Duct network is correctly dimensioned according to the unit configuration, insulated and water tight.
- Condensate drainage line is correctly dimensioned, equipped with trap and sloped.
- Filters are in position: correct size and quantity, clean.
- Wiring is correctly sized, and connected in accordance with wiring diagrams.
- Power supply lines are protected by recommended fuses and correctly earthed.
- Thermostat is correctly wired and positioned unit is checked for refrigerant charge and leaks.
- Indoor and outdoor fans rotate freely and are fixed on shafts.
- Indoor fan rotation speed is set.
- Access panels and doors are replaced to prevent air entering and risks of injury.
- Checking of the gas heating section, in accordance with above precedure.

⚠ WARNING: If any operating checks must be performed with the unit operating, it is the technician's responsibility to recognize any possible hazards and proceed in a safe manner. Failure to do so could result in severe personal injury or death due to electrical shock or contact with moving parts.

Table 3- Units Equipped with Gas Heating Modules, CE Marked

Sales Reference	G205	G250	G350	G400
Rooftop Air Conditioner	Gas Module Heating Capacity kW PCI (Output %)			
50 Hz EEC Voyager				
G20	**41,4 (92%)**	**49,1 (91%)**	**70,6 (90%)**	**77,4 (91%)**
G25	**35,0 (92%)**	**38,3 (89%)**	**59,4 (88%)**	**60,3 (90%)**
G31	**37,7 (92%)**	**48,6 (90%)**	**57,3 (88%)**	**78,2 (92%)**
YK*063CD	X			
YK*073CD	X			
YK*073DD	X			
YK*085CD	X			
YK*089CD	X			
YK*100CD	X			
YK*100BD		X		
YK*125CD		X		
YK*155BD			X	
YK*175CD			X	
YK*200BD				X
YK*250BD				X

Table 4 - Characteristics of G20, G25 and G31 Gases used by Gas-Fired Heating Modules fitted to YK* Roof Top Air Conditioners

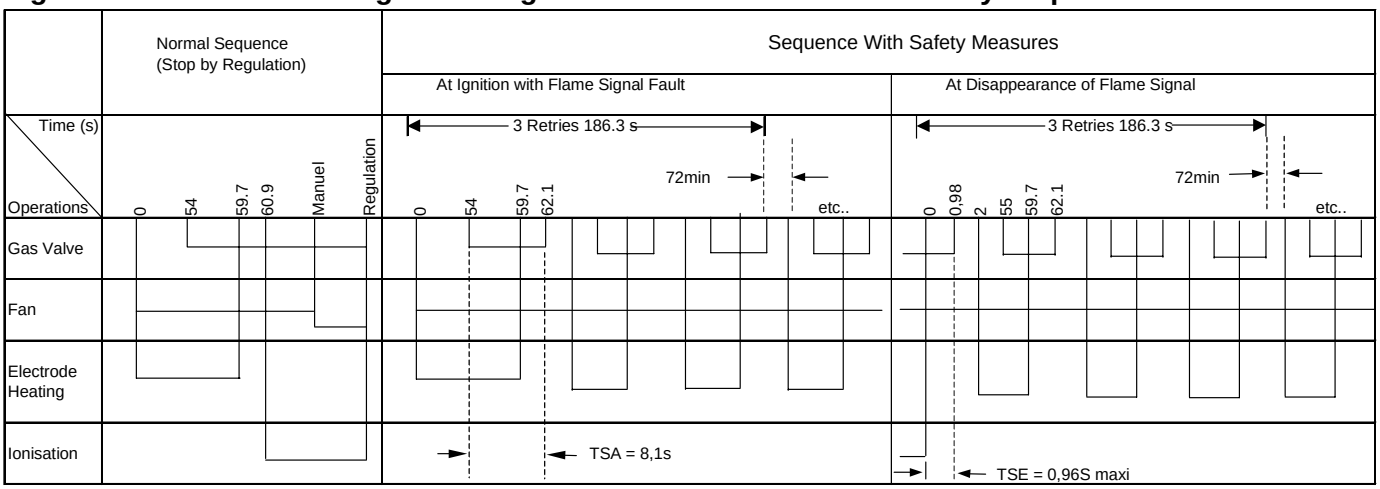
Module de chauffage		**G205**	**G250**	**G350**	**G400**
Natural Gas G20 (20mbar)					
34.02 MJ/m3 (15 C-1013)					
Injector diameter	(mm)	6,05	7,67	8,20	10,69
Heating Capacity	(kW)	77,4	41,4	49,1	70,6
Minimum Gas Pressure (Trip-out)	(mbar)	15,0	15,0	15,0	15,0
Normal Rate					
Gas Flow (15 C-1013 mbar)	(m3/h)	3,1	4,8	5,7	8,3
Heat Rate	(kW)	45,0	54,0	78,7	85,0
Reduce Rate					
Gas Flow (15 C-1013 mbar)	(m3/h)	4,6	5,1	8,1	8,5
Heat Rate	(kW)	43,5	48,0	76,8	80,0
Natural Gas G25 (20 ou 25 mbar)					
29.30 MJ/m3 (15 C-1013)					
Injector diameter	(mm)	7,67	8,20	9,80	10,69
Heating Capacity	(kW)	35,0	38,3	59,4	60,3
Minimum Gas Pressure (Trip-out)	(mbar)	15,0	15,0	15,0	15,0
Normal Rate					
Gas Flow (15 C-1013 mbar)	(m3/h)	4,7	5,3	8,3	8,2
Heat Rate	(kW)	38,0	43,0	67,4	67,0
Reduce Rate					
Gas Flow (15 C-1013 mbar)	(m3/h)	4,5	4,9	7,8	7,9
Heat Rate	(kW)	36,5	40,0	63,4	64,0
Natural Gas G31 (30, 37ou 50 mbar)					
88.00 MJ/m3 (15 C-1013)					
Injector diameter	(mm)	5,40	6,67	7,37	8,50
Heating Capacity	(kW)	37,7	48,6	57,3	78,2
Minimum Gas Pressure (Trip-out)	(mbar)	20,0	20,0	20,0	20,0
Normal Rate					
Gas Flow (15 C-1013 mbar)	(m3/h)	1,7	2,2	2,7	3,5
	(kg/h	3,2	4,2	5,1	6,6
Heat Rate	(kW)	41,0	54,0	65,3	85,0
Reduce Rate					
Gas Flow (15 C-1013 mbar)	(m3/h)	1,6	2,2	2,6	3,2
	(kg/h)	3,0	4,1	4,9	6,1
Heat Rate	(kW)	38,5	53,0	62,6	78,0
Combustion Air Flow (Avec E=25%)	(m3/h)	60,0	72,0	98,0	113,0

NOTE: GAS FLOW MAY VARY BY AS MUCH AS ± 10%

CE MARKING CATEGORY OF THE GAS SECTION IN THE DIFFERENT COUNTRIES

NL	FR	BE	GB/ES	IT	DE
Netherlands	France	Belgium	United Kingdom	Italy	Germany
II2L3P	II2E +3P	I2E + I 3P	II2H3P	I2H + (Natural Gas Only)	I 2E I 3P
			G20 - 20 mbar		
G31 30 mbar	G31 37 mbar				G37 50 mbar

Figure 7- Trane Gas Heating Module Ignition Controller Start and Safety Sequence



Use the following steps to complete the installation of the unit gas piping. (See Figure 8)

1. Install a tapped, style A (1/8 inch NPT tap) shut-off gas cock at the end of the gas supply line near the unit. Be sure the tapped gas cock is downstream of the pressure regulator, if used.

Note: The shut-off gas cock must be installed outside the unit, and should meet the specifications of all applicable National and Local Codes.

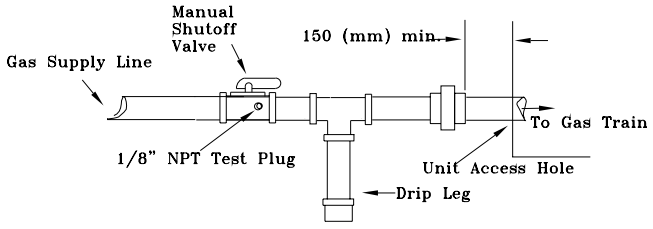
2 . Install a ground union joint downstream of the shut-off cock. This joint must be installed outside of the unit.

3 . Install a drip leg (at least 150 mm (6") in depth) next to the union as shown in Figure 8. This drip leg is required to collect any sediment that may be deposited in the line.

4 . Before connecting the piping circuit to the unit, bleed the air from the supply line. Then cap or plug the line and test the pressure at the tapped shut-off cock. The pressure reading should not exceed 35 mBar (14 inches water column).

5. Connect the gas piping to the unit. Check the completed piping for leaks using a soap and water solution, or equivalent.

Figure 8
Gas Piping Schematic



IMPORTANT NOTE: THIS UNIT USES A NEGATIVE REGULATION GAS VALVE. AT START-UP, THE OUTLET PRESSURE SHOULD BE CHECKED AND ADJUSTED IF REQUIRED TO A (NEGATIVE) -50Pa (-0.2" OF WATER COLUMN.) NEVER ADJUST THE REGULATOR TO A POSITIVE PRESSURE.

Manifold Pressure

The unit manifold pressure regulator (located on the gas valve) is factory installed and adjusted to provide the rated unit heating capacity. The required manifold pressure is factory set at (negative) - 50 Pa (2 inches of water column) for natural and LP gas.

Check the manifold pressure at the unit gas valve. Do not exceed the recommended pressure shown on the unit nameplate.

Filter Installation

To gain access to filters, remove the evaporator fan access panel. Each unit ships with 50 mm (2") filters. Number and size of filters is determined by size and configuration of the unit. Refer to the unit “Service Facts” for filter requirements.

Evaporator Fan Adjustment

Use the following procedure to determine the proper adjustment of the evaporator fan sheaves for a specific application.

1. Determine total system external static pressure Pa (inches of water column) with accessories installed. To accomplish this:

   a. Obtain the design airflow rate and the design external static pressure drop through the distribution system. Your sales representative or the design engineer can provide you with these values.

   b. Using the table from the Service Facts, add the static pressure drop of the accessories installed on the unit.

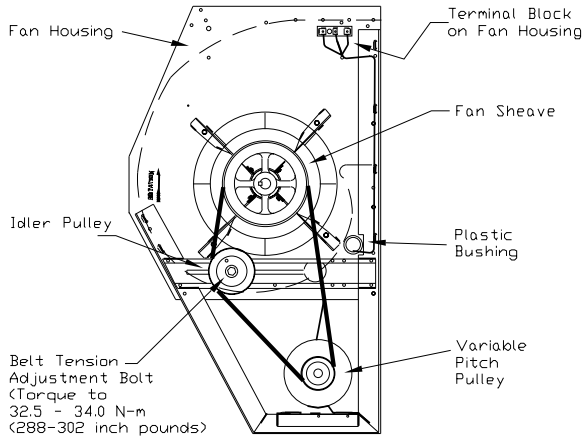
   c. Add the total accessory static pressure drop (from step 1b) to the design external static pressure. The sum of these two values is the total system external static pressure.

2. Use the table(s) in the Service Facts to find the external static pressure Pa (inches of water column) that most closely approximates total system external static pressure. Then locate the appropriate airflow rate (in m3/h) for your unit. The value obtained represents the kW for the evaporator fan motor and the fan RPM.

Important: kW (BHP) listed in the Table is the percentage range of nameplate amperage the motors will safely work within before an oversized motor is required.

3. Adjust the variable pitch pulley to increase or decrease the fan RPM as required. See Figure 9.

Figure 9
Typical fan, motor, and sheave assembly



TO INCREASE m3/h (CFM)
Loosen the pulley adjustment set screw and turn sheave clockwise

TO DECREASE m3/h (CFM)
Loosen the pulley adjustment set screw and turn sheave counter-clockwise

TO INCREASE BELT TENSION
Loosen the nut (next to the idler sheave) that secures the sheave in place. With a wrench, apply pressure clockwise on the outside nut (round headed one), until tension desired is reached. While holding pressure with the tension nut, retighten the nut next to the idler sheave.

Electrical Connections

Electrical wiring and grounding must be installed in accordance with national and local codes.

Electrical Power

It is important that proper electrical power is available for the unit. Voltage variation should remain within the limits stamped on the nameplate.

Power Entry

Holes are provided for low-voltage and high-voltage wiring. It is not necessary to punch any new holes in either the interior or exterior unit panels. If new holes are punched, performance will be adversely affected unless they are resealed to be both air- and watertight.

Disconnect Switch

Provide an approved weather-proof disconnect either on the side of unit or within close proximity.

Over Current Protection

The branch circuit feeding the unit must be protected in accordance with national and local codes.

Power Wiring

The power supply lines must be run in weather-tight conduit to the disconnect, and into the bottom of the unit control box. Provide strain relief for all conduit with suitable connectors.

IMPORTANT NOTE: Units with Scroll Compressors only. Proper scroll compressor rotation is determined by main power electrical connections. (See Compressor Electrical Phasing section.)

Provide flexible conduit supports whenever vibration transmission may cause a noise problem within the building structure.

Insure all connections are made tight.

Note: For branch circuit wiring (main power supply to unit disconnect), wire size for the length of run should be determined using the circuit ampacity found on the unit nameplate.

GROUNDING: THE UNIT MUST BE ELECTRICALLY GROUNDED IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.

Note: Unit must be grounded for igniter to operate properly. Gas pipe to unit is not an adequate ground. Ground the unit internally as provided. See unit wiring diagram for location of grounding lug.

Control Wiring

Note about 24V Volt Transformers:
Units have intergal circuit breakers in their low voltage transformers. If the breaker trips, be sure to open the unit disconnect before attempting to reset the breaker.

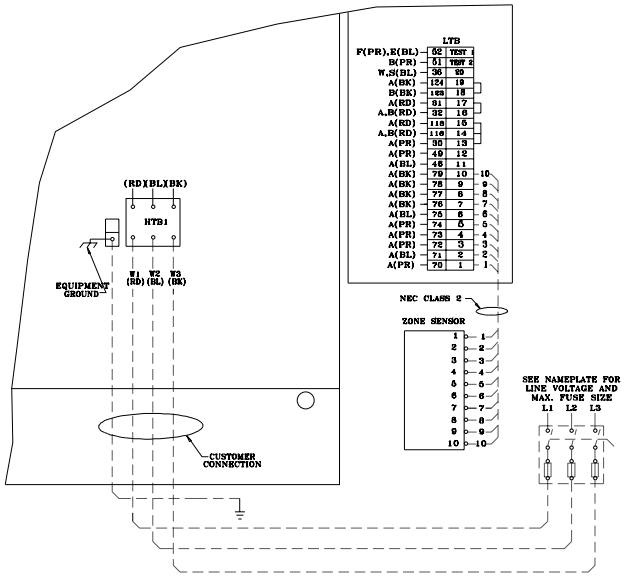
⚠WARNING: ***Open and lock unit disconnect. Failure to do so could result in severe personal injury or death due to electrical shock.***

Remove compressor access panel and control box panel to access transformer. Reset by pressing in on the black reset button located on the left side of the transformer.

Replace all panels before restoring power to the unit.

Note: The unit 24 volt transformer must not be used to power Field Installed Accessories (FIA), except for the ones that are factory supported.

Figure 10
Typical Field Wiring Diagram



Low voltage control wiring **must not** be run in conduit with power wiring. Route low voltage wire from zone sensor terminals through 7/8 inch bushing in the unit. See dimensional data for control wire entry location. Make connections as shown by the appropriate low voltage wiring diagrams in Figure 10.

Zone Temperature Sensor conductors are standard thermostat wire. The only exceptions are Tracer/Tracker installations which utilize a serial communications link and require a shielded twisted pair of conductors between the Tracer/ Tracker and the (TCI) Communications Interface.

Recommended wire sizes and lengths for installing the Zone Temperature Sensor are provided in Table 5. Ensure that the wiring between the controls and the unit's termination point does not exceed two and a half (2.5) ohms/conductor for the length of the run. Resistance in excess of 2.5 ohms per conductor can cause deviation in the accuracy of the control.

Table 5.

DC Conductors

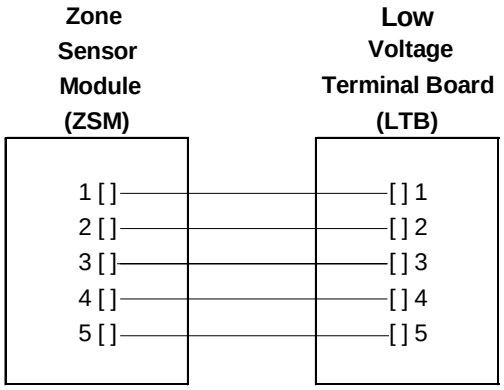
Wire size (mm2)	Maximum wire length (m)
0.33	45
0.50	76
0.75	115
1.30	185
2.00	300

NOTE: Do not run the electrical wires transporting DC signals in or around conduit housing high voltage wires.

Zone Temperature Sensor and low voltage terminal designations are no longer R-W-Y-G-B etc, they are now 1-2-3 etc. Connections should be made using 1 to 1, 2 to 2, 3 to 3, and so on. See following example.

Zone Temperature Sensor Terminal Strip

Terminal #	Terminal I.D.
1	ZTEMP
2	SIGNAL COMMON
3	CSP
4	MODE
5	HSP
6	LED COMMON
7	HEAT LED
8	COOL LED
9	SYS ON LED
10	SERVICE LED



Emergency Shut Down

For Emergency Shut Down, remove the jumper between LTB-16 and LTB-17 and install normally closed contacts (Open at Fault Condition). Immediate shut down will occur and the UCP will be disabled.

Compressor Disable

To disable Compressor #1, remove the jumper between LTB-13 and LTB-14 and install normally closed contacts (open to disable).

To disable Compressor #2, (if applicable), remove the jumper between LTB-14 and LTB-15 and install normally closed contacts (open to disable).

Scroll Compressors

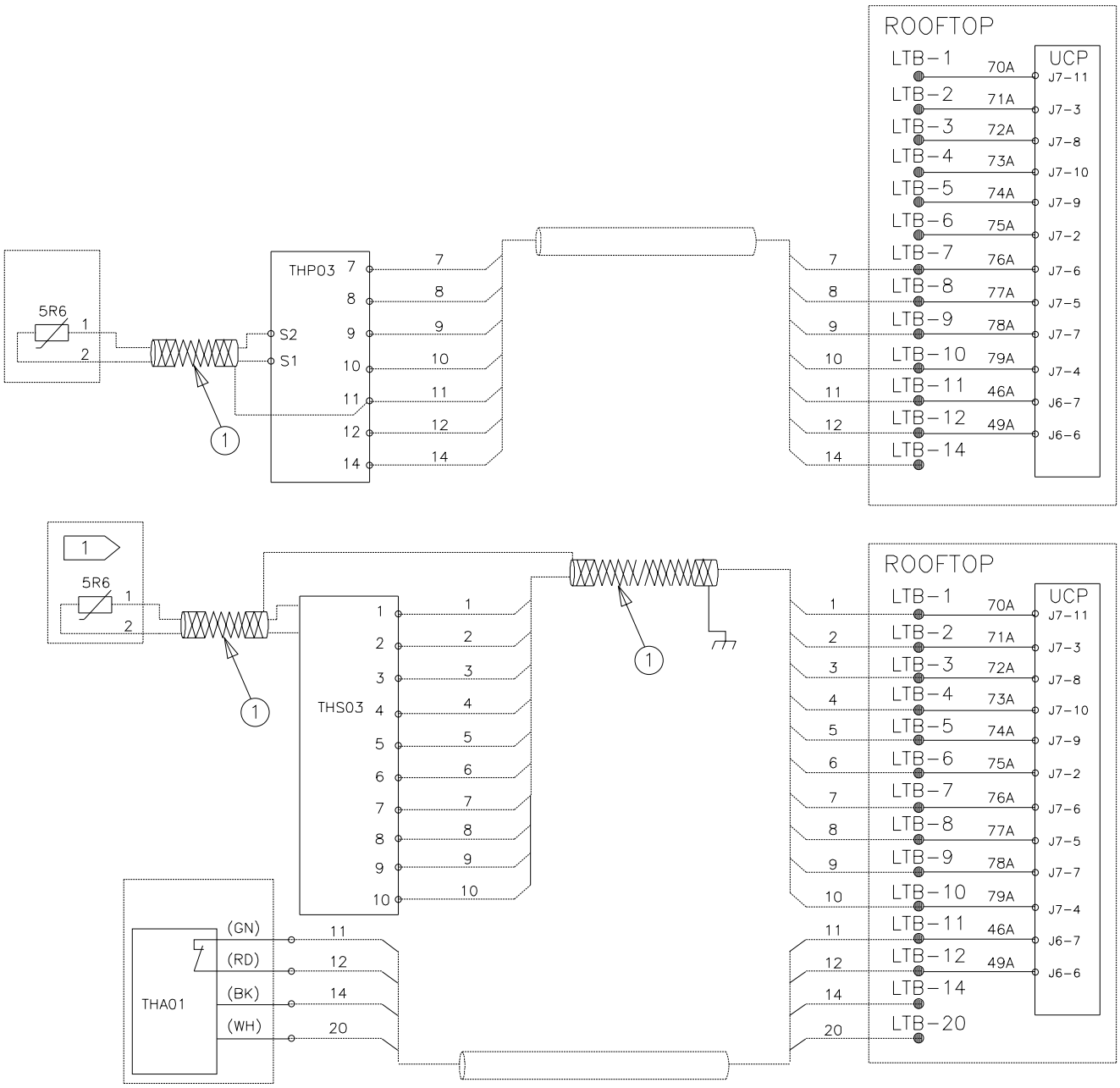
(125 - 250 Units only)

Because scroll compressors are uniquely different from traditional reciprocating compressors, their operating characteristics and requirements represents a departure from reciprocating compressor technology.

Proper phasing of the electrical power wiring is critical for proper operation and reliability of the scroll compressor.

Proper rotation of the scroll compressor must be established before the unit is started. This is accomplished by confirming that the electrical phase sequence of the power supply is correct. The motor is internally connected for clockwise rotation with the inlet power supply phased A, B, C.

Figure 11A
Zone Sensor Interconnections



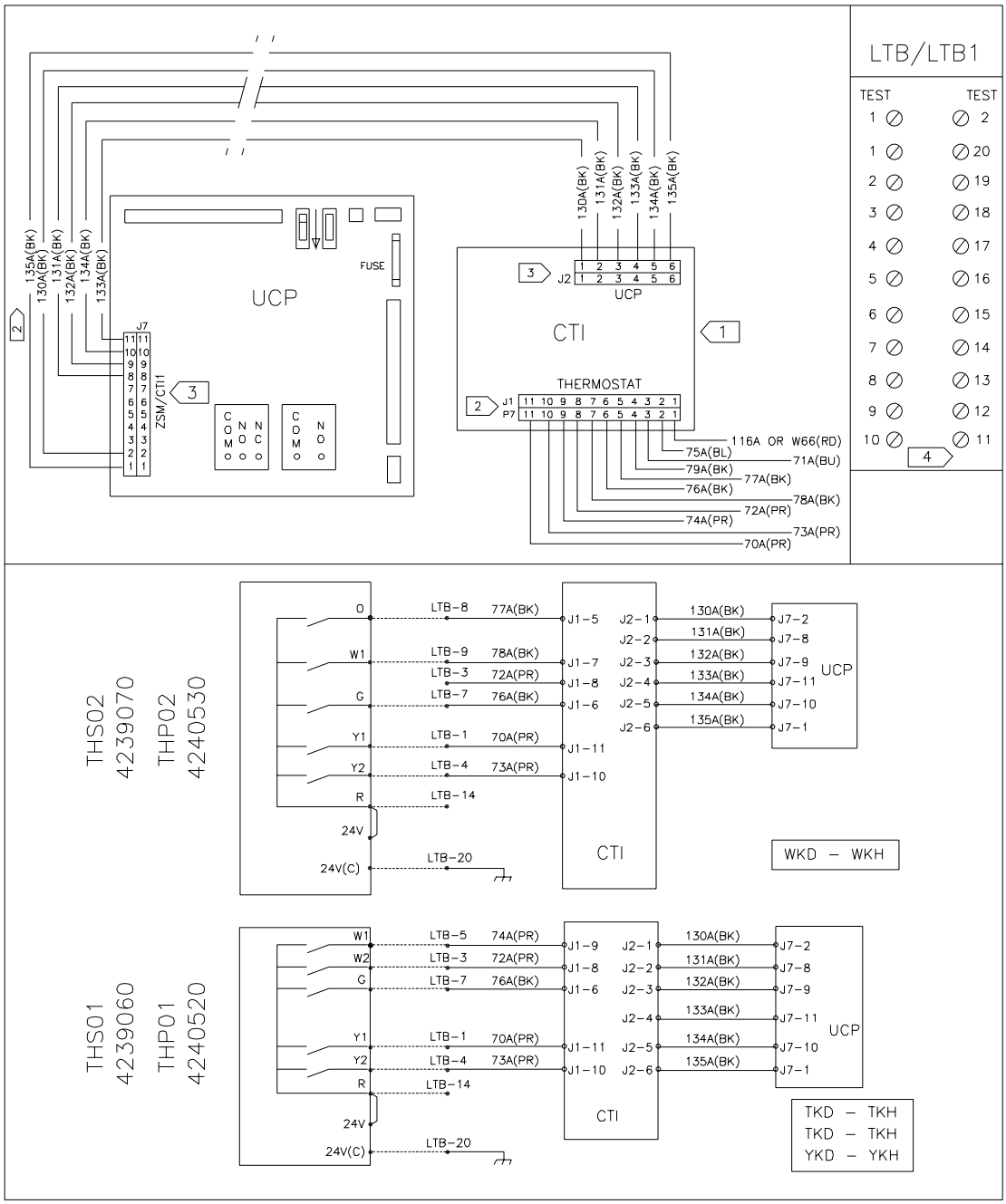
———	TRANE WIRING
.....	CUSTOMER WIRING

ITEM	DESCRIPTION
LTB-...	CONTROL TERMINAL BLOCK
THS03	STANDARD THERMOSTAT
THP03	PROGRAMMABLE THERMOSTAT
5R6	REMOTE SENSOR
GTC	BUILDING MANAGEMENT SYSTEM
TCI-3	TRANE COMMUNICATION INTERFACE
THA01	OCCUPANCY SENSOR
UCP	UNIT CONTROL MODULE

1 DISCONNECT THE THERMOSTAT'S THERMISTOR RTI WHEN REMOTE SENSOR OPTION IS USED.

(1) SHIELDED, TWISTED PAIR WIRE.

Figure 11B
Conventional Thermostat Interconnections



1 MOUNT CTI IN CONTROL BOX IN THE HOLES PROVIDED WITH 4 SCREWS INCLUDED.

2 REMOVE CONNECTOR P7 FROM J7 OF THE UCP AND INSTALL CONNECTOR ON J1 OF THE CTI.

3 UTILIZE CABLE INCLUDED WITH CTI TO CONNECT J2 OF THE CTI TO J7 OF THE UCP.

4 CONNECT ROOM THERMOSTAT TO TERMINAL BLOKC (X...LTB..) AS SHOWN FOR THE TYPE UNIT. PLACE WIRING DIAGRAM LABEL ON INSIDE OF ACCESS PANEL.

———	TRANE WIRING
- - - - - - -	CUSTOMER WIRING

ITEM	DESCRIPTION
CTI	CONVENTIONAL THERMOSTAT INTERFACE
LTB	TERMINAL BLOCK
UCP	UNITARY CONTROL MODULE
24V(C)	0 VOLT STRIP
R – 24V	THERMOSTAT SUPPLY 24V
Y1 – Y2	COMPRESSOR CONTROL
G	SUPPLY FAN CONTROL
O	SWITCH OVER VALVE
W1	ELECTRIC HEATER CONTROL
THS	STANDARD CONTROL THERMOSTAT
THP	PROGRAMMABLE CONTROL THERMOSTAT
HTR	HEATING COIL

Diagram Improper Electrical Phase Sequence

Proper compressor motor electrical phasing can be quickly determined and corrected before starting the unit. Use a quality instrument such as an Associated Research Model 45 Phase Sequence Indicator and follow this procedure.

1. Open the electrical disconnect or circuit protection switch that provides line power to the High Voltage Terminal Block (HTB1) in the control panel.

2. Connect the phase sequence indicator leads to the HTB1 as follows:

Phase Seq. Lead	HTB1 Terminal
Black (Phase A)	L1
Red (Phase B)	L2
Yellow (Phase C)	L3

⚠ WARNING: ***Bodily injury can result from high voltage electrical components. If operating checks must be performed with the unit operating, it is the technician's responsibility to recognize these hazards and proceed safely. Failure to do so could result in severe personal injury or death due to electrical shock or contact with moving parts.***

3 . Read the phase sequence on the indicator after turning power on by closing the unit disconnect switch. The "ABC" indicator on the face of the phase indicator will glow if phase is ABC.

4. If the "CBA" indicator glows instead, open the unit main disconnect and interchange any two main line leads on HTB1. reclose the unit main disconnect and recheck phasing.

5. Open units main disconnect before continuing with installation.

6. Disconnect the phase indicator.

⚠ WARNING: ***Open and lock unit disconnect switch before continuing installation. Failure to do so could result in severe personal injury or death due to electrical shock or contact with moving parts.***

Note: If a phase indicator is not available, follow the electrical phasing sequence in the cooling start-up section to insure proper compressor rotation.

IMPORTANT: After completion of wiring, check all electrical connections, including factory wiring within the unit, and ensure all connections are tight. Replace and secure all electrical box covers and access doors before leaving unit or connecting power to circuit supplying unit.

After all electrical wiring is complete, SET THE ZONE SENSOR SWITCH TO THE **OFF** POSITION AND THE FAN SWITCH TO **AUTO** SO COMPRESSOR AND FAN WILL NOT RUN, and apply power by closing the system main disconnect switch. This will activate the compressor crankcase heaters.

Do not change the zone sensor setting until power has been applied long enough to evaporate any liquid refrigerant in the compressor. It is recommended the crankcase heaters be energized for 8 hours prior to starting.

Exception - Both circuits on the125 thru 250 units are not equipped with crankcase heaters.

Start-Up
Pre-Start Quick Check List

[ ] Is unit properly located and level with proper clearances? See Figure 1A and 1B.

[ ] Is the duct work correctly sized, run, taped, insulated and weather proofed with proper unit arrangement? (See duct work installation)

[ ] Is the gas piping correctly sized, run, and purged of air? (See gas piping)

[ ] Is condensate line properly sized, run, trapped and pitched?

[ ] Is the filter of the correct size and number, clean and in place?

[ ] Is the wiring properly sized and run in according to the unit wiring diagram?

[ ] Are all wiring connections tight including those in unit and compressor electrical boxes?

[ ] Has the unit been properly grounded and fused with the recommended fuse size? (see wiring data)

[ ] Is the zone temperature sensor correctly wired and in a good location?

[ ] Have the air conditioning systems been checked at the service ports for charge and leak tested if necessary?

[ ] Does the condenser fan and indoor blower turn freely without rubbing and are they tight on the shafts?

[ ] Has the indoor blower speed been determined and the proper speed been set? (See air flow performance data)

[ ] Has all work been done in accordance with applicable local and national codes?

[ ] Are all covers and access panels in place to prevent air loss and safety hazards?

⚠ WARNING: ***Bodily injury can result from high voltage electrical components. If operating checks must be performed with the unit operating, it is the technician's responsibility to recognize these hazards and proceed safely. Failure to do so could result in severe personal injury or death due to electrical shock or contact with moving parts.***

Power-up Initialization

The “initialization” by the Unitary Control Processor **(UCP)** occurs each time the system is powered-up. The **UCP** performs internal self-diagnostics checks, which include identifying the equipment components of its system, and the configuring of itself to that system. It also checks itself to be sure it is functioning correctly. On units with the optional economizer, the damper is driven open for 15-20 seconds and then fully closed for 90 seconds. The **UCP** system indicator **LED** is turned to **“ON”** within one second of start-up if operation is correct.

The Unitary Control Processor **(UCP)** switches are factory set to provide comfort for most applications. Control cycles may be adjusted as indicated in the table below. These switches function similar to the heat anticipator adjustment in conventional thermostats.

Unitary Control Processor (UCP)
Switch Settings for Cycle Timing

Switch 1	Switch 2	Cycle Time
OFF	OFF	NORMAL (Factory Setting)
OFF	ON	LONGER
ON	OFF	SHORTER
ON	ON	*SPECIAL

* Special applications, where very short cycles are necessary to prevent excessive temperature swings.

Starting the Unit in the Heating Mode

Note: See “Sequence of operation” in the unit Service Facts for a complete description of heating operating sequence.

Check to ensure all grilles and registers are open and all unit access doors are closed before start-up.

Purge the gas supply line of air by opening the union ahead of the unit. When the odor of gas is detected, re-tighten union and wait 5 minutes before proceeding.

Place the zone system switch in the heat position.

Postition the heating setpoint approximately 6°C (10°F) degrees above room temperature and place the fan switch in "Auto" or "On" position.

Open the main gas valve and turn on unit main power supply.

Note: To bypass time delays, and verify the operation of this unit from the roof, use the “Test mode procedure” on page 3 and 4 of this manual.

The combustion blower motor and ignitor should energize. The main burners should light within one minute from the time the combustion blower starts. Initial start may be delayed somewhat if unit is not purged and air is trapped in gas line.

If burners fail to ignite after 3 tries the ignition system will lockout. Reset by disconnecting and re-applying unit power.

Unit will start in the high fire mode. After a short run cycle it will switch to low fire.

Note: Blue smoke produced by the heat exchanger during the initial burner firing is caused by a thin film of oil on the surface of the heat exchanger. This oil will burn off quickly.

Check control operation and burner operating conditions through the sight glass in burner assembly cover.

Manifold Pressure

Connect a manometer to the pressure tap at the outlet side of the unit gas valve. Read the manifold pressure with the main burners firing. The manifold pressure reading indicated should be a (negative) -50 Pa (2 inches of water column.)

If the manifold pressure reading does not match the value indicated on the unit nameplate, the unit pressure regulator must be adjusted as follows:

Remove the cover screw on the gas regulator (located on the top side of the unit gas valve).

Turn the adjusting screw clockwise to increase manifold pressure, or counter-clockwise to decrease manifold pressure.

⚠ WARNING: ***Open and lock unit disconnect switch before continuing installation. Failure to do so could result in severe personal injury or death due to electrical shock or contact with moving parts.***

Adjust the evaporator fan motor rpm (at the motor sheave) to a speed which most closely approximates the rpm value found in the motor sheave/fan speed (rpm) table in the Service Facts. To insure proper unit operation, the resulting airflow must be within + or - 20 percent of the nominal airflow rate.

After adjusting the evaporator fan, check heat exchanger temperature rise during furnace operation to insure that it falls within the range specified on the unit nameplate.

If the temperature rise noted is outside of the specified limits, adjust the fan motor sheave to cause the temperature rise of the heat exchanger to fall within the required range.

Heating Shut-down

To exit the test mode, disconnect unit power for 3-5 seconds and reapply. When running the unit using the zone sensor as the control, position the selector switch at "Off". There will be a delay of 0 - 90 seconds before the unit shuts down in this setting.

⚠ WARNING: ***Do not operate the unit without the evaporator fan access panel in place. Reinstall the access panel after performing any maintenance procedures on the fan. Operating the unit without the access panel properly installed may result in severe personal injury or death.***

Starting The Unit In The Cooling Mode

IMPORTANT NOTE: **Before starting the system in the cooling cycle, turn the zone sensor switch to "off" and close the unit disconnect switch. This procedure energizes the compressor crankcase heaters, vaporizing any liquid refrigerant in the crankcase. This is a precaution against foaming at start-up, which could damage the compressor bearings. Allow the heater to operate for a minimum of eight hours.**

Exception - Both circuits on the125 thru 250 units are not equipped with crankcase heaters.

Electrical Phasing (Scroll Compressors) If compressor electrical phasing is incorrect, compressor and indoor fan will operate in reverse, several symptoms will be apparent.

Compressors will draw low current.

Suction and discharge pressure will change very little.

A slight rattling or rumbling sound may be apparent.

Unit will not cool

Indoor fan (evaporator) will run backwards

If allowed to run backward for an extended period (5 minutes), the motor windings will overheat and cause the compressor to cycle on its thermal protector and the oil will be pumped out of the compressor.

To correct the rotation, open unit disconnect and interchange any two of the line wires at the high voltage terminal block, in the control box.

⚠ WARNING: ***Open and lock unit disconnect switch before continuing installation. Failure to do so could result in severe personal injury or death due to electrical shock or contact with moving parts.***

Verify that the unit airflow rate is adjusted according to information provided in "Determining Evaporator Fan Adjustment" section of this manual.

Note: See "Sequence of operation" in the unit Service Facts for a complete description of cooling operating sequence.

To start the unit in the cooling mode, Close unit disconnect switch and set the zone sensor system switch to COOL and move the cooling setpoint approximately 10 degrees below room temperature. There will be a delay of up to 5 minutes before the unit will start automatically.

To bypass time delays, and verify the operation of this unit from the roof, use the "Test mode procedure" on page 3 and 4 of this manual.

Operating Pressures

After the unit has operated in the cooling mode for a short period of time, install pressure gauges on the gauge ports of the discharge and suction line valves.

Note: Always route refrigerant hoses through the port hole provided and have compressor access panel in place.

Check the suction and discharge pressures and compare them to the normal operating pressures provided in the unit's Service Facts.

Note: Do not use pressures from Service Facts to determine the unit refrigerant charge. The correct charge is shown on the unit nameplate. To charge the system accurately, weigh the cha**rge.**

Voltage

With the compressor operating, check the line voltage at the unit. The voltage should be within the range shown on the unit nameplate. If low voltage is encountered, check the size and length of the supply line from the main disconnect to the unit. The line may be undersized for the length of the run.

Cooling Shut Down

To exit the test mode, disconnect unit power for 3-5 seconds and re-apply. When running the unit using the zone sensor as the control, position the selector switch at **"Off"**. There may be a delay of up to 3 minutes before compressors shut down and an additional 1 minute before the fan shuts down in this setting.

Do not de-energize main power disconnect except when unit is to be serviced. Power is required to keep air conditioning compressor crankcase warm and boil off refrigerant in the oil.

Exception - Both circuits on the125 thru 250 units are not equipped with crankcase heaters.

(EDC) Evaporator Defrost Control

During low ambient operation (below 13°C for single condenser fan units, and below 4°C for dual condenser fan units) compressor run time is accumulated by the UCP. When compressor run time reaches approximately 10 minutes, an evaporator defrost cycle is initiated. The defrost cycle lasts approximately 3 minutes.

During a defrost cycle, the compressor(s) are turned off and the indoor motor continues to run. After completing the defrost cycle the unit returns to normal operation, and the compressor run time counter is reset to zero.

Economizer operation is not affected by a defrost cycle.

Final Installation Checklist

[ ] Does the unit run and operate as described in the “Sequence of Operation” in the unit Service Facts?

[ ] Is the condenser fan and indoor blower operating correctly, with proper rotation and without undue noise?

[ ] Is the compressor operating correctly and has the system been checked with a charging chart?

[ ] Have voltage and running currents been checked to determine if it is with limits?

[ ] Have the air discharge grilles been adjusted to balance the system?

[ ] Has the ductwork been checked for air leaks and condensation?

[ ] Has the furnace manifold pressure been checked and adjusted if necessary?

[ ] Has the heating air temperature rise been checked?

[ ] Has the indoor airflow been checked and adjusted if necessary?

[ ] Has the unit been checked for tubing and sheet metal rattles and are there unusual noises to be checked?

[ ] Are all covers and panels in place and properly fastened?

[ ] Has the owner or maintenance personnel been given this manual, warranty, and been instructed on proper operation and maintenance?

Routine Maintenance by Owner

You can do some of the periodic maintenance functions for your unit yourself; this includes replacing (disposable) or cleaning (permanent) air filters, cleaning unit cabinet, cleaning the condenser coil, and conducting a general unit inspection on a regular basis.

Season Maintenance - Cooling

To keep the unit operating safely and efficiently, the manufacturer recommends that a qualified serviceman check the entire system at least once each year, or more frequently if conditions warrant.

Examine these areas of unit:

1. Filters (for cleaning or replacement)

2. Motors and drive system components

3. Economizer gaskets (for possible replacement)

4. Condenser coils (for cleaning)

5. Safety Controls (for mechanical cleaning)

6. Electrical components and wiring (for possible replacement or connection tightness)

7. Condensate drain (for cleaning)

8. Inspect the unit duct connections to ensure they are physically sound and sealed to the unit casing.

9. Inspect the unit mounting support to see that it is sound.

10. Inspect the unit to ensure there is no obvious deterioration.

Season Maintenance - Heating

Complete the unit inspections and service routines described below at the beginning of each heating season.

⚠ WARNING: ***To prevent injury or death due to electrical shock of contact with moving parts, lock unit disconnect switch in open position before servicing unit.***

⚠ WARNING: ***To prevent an explosion and possible injury, death and equipment damage, do not store combustible materials, gasoline or other flammable vapors and liquids near the unit.***

[ ] Visually inspect the unit to ensure that the airflow required for combustion is not obstructed from the unit.

[ ] Visually inspect the flue stack to ensure the exhaust path is clear and free of obstructions.

[ ] Inspect the control panel wiring to verify that all electrical connections are tight, and that wire insulation intact.

[ ] Check the operation of the gas ignition system: To do this, turn off the gas supply with the unit operating to verify that the gas valve closes, and that a re-ignition cycle is initiated by the unit.

[ ] Visually inspect all of the unit’s flue product passageways for excessive deposit buildup and corrosion. If buildup or corrosion is apparent, perform the necessary repairs.