



**TRANE®**

# Gas-fired rooftop

YCD/YCH : 060-075-085-100-120-150-175-200-250

With gas heating module : G150-G205-G250-G350-G400- **CE** marked

Installation - Operation - Maintenance

To be used in conjunction with the UCP2 module's manual,  
reference L80 GE 001 E.



## Foreword

These Installation Operation and Maintenance instructions are given as a guide to good practice in the installation, start-up, operation and periodic maintenance by the user of YCD/YCH.

They do not contain the full service procedures necessary for the continued successful operation of this equipment. The services of a qualified service technician should be employed, through the medium of a maintenance contract with a reputable service company.

## Warranty

Warranty is based on the general terms and conditions of the constructor. The warranty is void if the equipment is modified or repaired without the written approval of the constructor, if the operating limits are exceeded, or if the control system or the electrical wiring is modified.

Damage due to misuse, lack of maintenance, or failure to comply with the manufacturer's instructions, is not covered by the warranty obligation.

If the user does not conform to the rules of chapter "Maintenance", it may entail cancellation of warranty and liabilities by the constructor.

## Reception

On arrival, inspect the unit before signing the delivery note. Specify any damage on the delivery note, and send a registered letter of protest to the last carrier of the goods within 72 hours of delivery. Notify the local sales office at the same time.

The unit should be totally inspected within 7 days of delivery. If any concealed damage is discovered, send a

registered letter of protest to the carrier within 7 days of delivery and notify the local sales office.

Units are shipped with the refrigerant operating or holding charge and should be examined with an electronic leak detector to determine the hermetic integrity of the unit. The refrigerant charge is not included in the standard Warranty Cover.

## General information

### About this manual

Cautions appear at appropriate places in this instruction manual. Your personal safety and the proper operation of this machine require that you follow them carefully.

The constructor assumes no liability for installations or servicing performed by unqualified personnel.

### About the unit

These YCD/YCH units are assembled, pressure tested, dehydrated, charged and run tested before shipment. The information contained in this manual applies to units designated YCD/YCH.

YCD/YCH units are designed to operate in cooling mode only, whereas nom de l'unité can operate in cooling or heating modes.

## Refrigerant

The refrigerant provided by the constructor meets all the requirements of our units. When using recycled or reprocessed refrigerant, it is advisable to ensure its quality is equivalent to that of a new refrigerant. For this, it is

necessary to have a precise analysis made by a specialized laboratory. If this condition is not respected, the constructor warranty could be cancelled.

# Index

Foreword .....	2
Warranty .....	2
Reception .....	2
General .....	2
Refrigerant .....	2
Unit control features .....	4
Zone sensor operation .....	4

## Installation

Reception of units .....	6
Installing the unit on the ground .....	7
Electrical connection .....	7
Condensate drain piping .....	8
Filter installation .....	8
To increase belt tension .....	9
Control wiring .....	9
Unit controlled by thermostat .....	9
Unit controlled by BAS .....	9
Unit controlled by tracker supervisor .....	9
Connections of accessories installed on site .....	10
3D-Scroll compressors .....	10
Gas pipework installation .....	10
Operating principles of the gas heating module .....	11
Putting the gas-fired heating module into operation .....	11
When the measured partial vacuum is positive .....	13
Adaptation to gases available .....	13
Start-up .....	13

## Operation

Power-up initialization .....	19
Heating mode start-up and shutdown .....	19
Cooling mode start-up and shutdown .....	19
Smoke detector .....	19
Clogged filter detector .....	20
Disconnect switch .....	20
Final installation checklist .....	20
Burner skeleton diagram .....	20

## Maintenance

Maintenance by owner .....	21
Maintenance by serviceman .....	21
Trouble-shooting repair .....	22
Safety recommendations .....	24
Maintenance contract .....	24
Training .....	24

**Table 1 : Units equipped with gas heating modules, CE marked.**

Sales reference	Heating module				
	G150	G205	G250	G350	G400
<b>Rooftop air-conditioner</b>	<b>Gas module heating capacity kW PCI (output %)</b>				
<b>50 Hz EEC Voyager</b>					
<b>G20</b>	<b>26,0 (88%)</b>	<b>41,4 (92%)</b>	<b>49,1 (91%)</b>	<b>70,6 (90%)</b>	<b>77,4 (91%)</b>
<b>G25</b>	<b>22,8 (86%)</b>	<b>35,0 (92%)</b>	<b>38,3 (89%)</b>	<b>59,4 (88%)</b>	<b>60,3 (90%)</b>
<b>G31</b>	<b>24,4 (87%)</b>	<b>37,7 (92%)</b>	<b>48,6 (90%)</b>	<b>57,3 (88%)</b>	<b>78,2 (92%)</b>
YC*060S4H...		X			
YC*075S4H...		X			
YC*085S4H...		X			
YC*100S4M...		X			
YC*100S4H...			X		
YC*120S4L...	X				
YC*120S4H...			X		
YC*150S4L...			X		
YC*150S4H...				X	
YC*175S4L...			X		
YC*175S4H...				X	
YC*200S4L...			X		
YC*200S4H...					X
YC*250S4L...			X		
YC*250S4H...					X

\* = "H" for horizontal air discharge ; "D" for vertical downflow air discharge.

## Unit Control 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 control wiring. This means there is no field configuration necessary when replacing the UCP, except for the zone comfort switch settings.

### 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.

## Zone sensor operation

The zone sensors provide the user controls and zone temperature sensing function. The operator controls are as follows :

### 1) Unit mode

- HEAT : Heat functions only enabled
- AUTO : Auto-changeover between cooling mode and heating mode as required by zone load.
- OFF : No heating or cooling functions
- COOL : Cooling functions only (including economizing option) enabled

### 2) Fan settings

- FAN AUTO : Fan settings
- FAN ON : Fan runs at all times. This is the setting used when minimum ventilation is required. When the fan is running, the economizer dampers (option) will be open to at least the minimum position.

### 3) Optional 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 is in 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.

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 installation on the fan/filter status input.

### 4) Test mode procedure at the UCP control board

Operating the unit from the roof using the test mode at the UCP control board.

**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 to three 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 (see test mode table 2).
- To continue to the next step, reapply 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 2.
- 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 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 2).
- 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.
- If the test mode is to be started again, cycle the unit power and reapply the jumper.
- 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 2).
- 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.

**Table 2 : Test mode YCD/YCH 060 to 250**

Step	Mode	Fan	Econ	Cool 1	Cool 2	Heat 1	Heat 2	Heat 3	Defrost	Em Heat d'urgence
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	Heat 1	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 gas/electric units						
8 **	Defrost			Not applicable on gas/electric units						
9 **	Em Heat			Not applicable on gas/electric units						

\* : With optional accessory  
 \*\* : With heat pump

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

**Table 3 : Resistance values chart**

Step	Mode	Ohms
1	Fan On	2,2 k
2 *	Economizer	3,3 k
3	Cool 1	4,7 k
4	Cool 2	6,8 k
5	Heat 1	10 k
6 *	Heat 2	15 k
7 *	Heat 3	22 k
8 **	Defrost	33 k
9 **	Emergency Heat	47 k

\* : With optional accessory  
 \*\* : With heat pumps

# Installation

**General information :** The installation must conform all standards and regulations.

## A. Reception of units

### 1) Rooftop curb (YCD accessories)

Rooftop curbs are available as an accessory for "down-flow" units. The curbs are supplied pre-assembled on wooden pallets, packed under plastic film. Two types of self-adhesive seals are provided to ensure the rooftop-rooftop curb seal is leak-tight (40 mm wide for the perimeter, 20 mm wide for the crosspieces).

### 2) Rooftop unit

The unit is supplied on a wooden frame. It is recommended to check the machine's condition upon reception. There are two ways to handle the unit:

- 1) Use the openings in the wooden frame to handle the machine using a fork lift, in accordance with applicable safety regulations.
- 2) Use a lifting beam correctly adjusted to fit the unit (figure 1).

**Caution.** Wooden side panels protect the coils from being damaged and losing their refrigerant charge. These panels must only be removed when all handling of the unit has terminated.

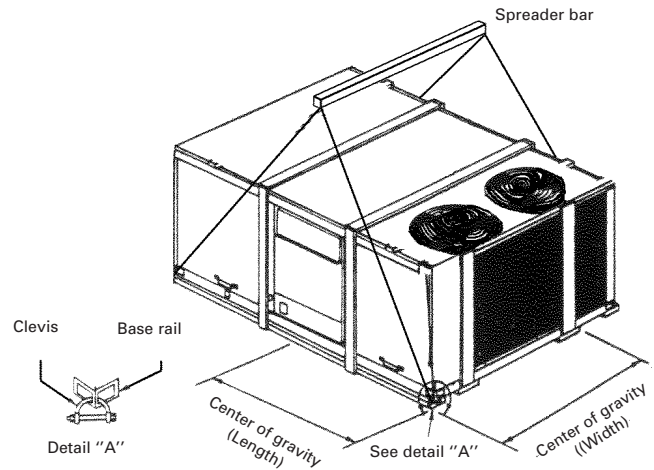
**Caution.** Accessories not mounted in the factory are supplied either in the unit's electric panel (thermostats and remote sensors), or in the fan section (filter set disconnection switch and oversize drive).

### 3) Handling

**Positioning and lifting.** The units are supplied on the truck but are not unloaded. An opening is provided on each corner of the unit's base to facilitate handling. 4 shackles and 4 slings are required. Use a lifting beam to prevent the cables pressing too hard on top of the unit during lifting. Figure 1 indicates the position of the centre of gravity and the lifting recommendations.

**Important :** For unit to fit on the roof curb the fork lift pockets must be removed.

**Figure 1**



**Table 4 : Weights & center of gravity (figure 1)**

Unit	Weight (kg)	Charge R22 (kg)	Center of gravity (cm)	
			Length	Width
YCD/YCH 060	340	4,2	990	534
YCD/YCH 075	360	4,8	990	534
YCD/YCH 085	440	3,2/circ.	990	508
YCD/YCH 100M	460	3,9/circ.	990	508
YCD/YCH 100H	540	3,1/3,2	1067	635
YCD/YCH 120	562	4/4,5	1092	661
YCD/YCH 150	645	4,3/circ.	1143	736
YCD/YCH 175	645	5,1/circ.	1346	889
YCD/YCH 200	906	6,5/circ.	1346	889
YCD/YCH 250	956	7,7/circ.	1346	889

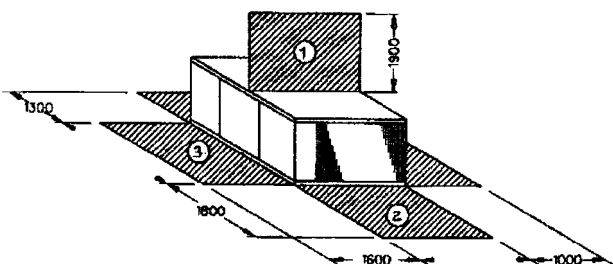
060-075 : 1 circuit  
085-250 : 2 circuits

Unit	Curb	Econ.	Hot w. coil	Elec. heater
YCD/YCH 060	112	20	32	18
YCD/YCH 075	112	20	32	18
YCD/YCH 085	112	20	65	22
YCD/YCH 100M	112	20	65	22
YCD/YCH 100H	180	20	85	34
YCD/YCH 120	180	20	85	34
YCD/YCH 150	220	30	95	34
YCD/YCH 175	220	30	95	34
YCD/YCH 200	260	38	110	36
YCD/YCH 250	260	38	110	36

## B. Installing the unit

### Positioning and clearances

Figure 2



The structure accommodating the unit(s) must be designed to support the equipment in operation, as a minimum. Refer to table 4, figure 2 and the space requirement plan.

## C. Unit mounting on roof

Fix the rooftop curb on the joint beam of the building's structure.

Make the rooftop curb's sealing surface level using angle brackets adjusted by screw bolts, located around its perimeter.

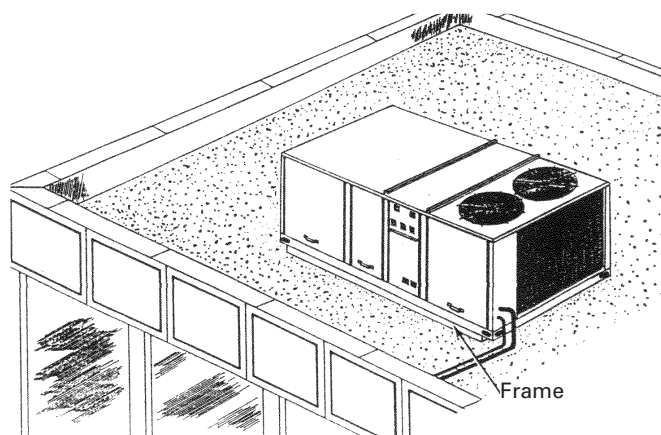
Place the adhesive seals on the curb's sealing surface (perimeter and crosspieces).

Make the rooftop leaktight around the curbs before installing the unit, in compliance with current construction standards.

**Note :** the unit must be installed perfectly level to ensure condensates flow from the condensate tray.

The rooftop unit nests into the curb and is supported by it. Position the unit, taking care to comply with the indicated directions: the unit's discharge and intake openings must match those of the curb (figure 3).

Figure 3 : Installation de l'unité en toiture

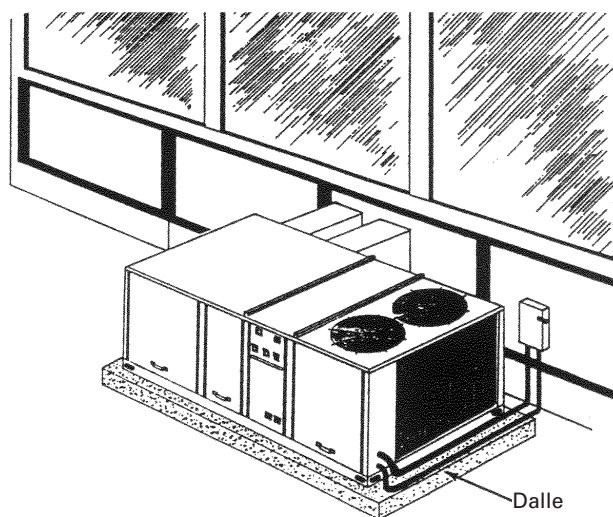


## D. Installing the unit on the ground

To install the unit on the ground its base must be level and supported securely.

For horizontal discharge units, a support is required such as a metal or concrete slab whose height must be determined according to the amount of snow cover, to prevent problems with condensation drainage and obstruction of the external coil. If necessary use an anti-vibration material between the rooftop unit's base and the support (figure 4).

Figure 4 : Ground mounted unit



## E. Electrical connection

The electric panel is located in the unit's compressor section.

Remove the compressor access panel.

Voltage: the unit is designed to run with 400 V +/- 5%/50 Hz/ 3 ph.

A 400 V / 24 V transformer supplies the control circuit's power.

Power wiring. A disconnect switch must be installed near the unit, and the auxiliary contacts to trip must be wired up. It must also be possible to lock the disconnect switch in the break position. The unit's power supply must be provided by 4-wire cable with cross-sectional areas complying with legislation.

The power supply cables must be laid in leak-tight pipes and pass through the bottom of the electric panel. The cables must not be taut. Appropriate connectors must be provided. Flexible pipe supports are required to prevent noise transmission in the building's structure.

Ensure all the connections are tightened.

**Note :**

- a) earthing must be executed in accordance with local legislation.
- b) the machines are designed for a short-circuit current of 10 kA. In the event of a higher application, contact your Trane sales office.



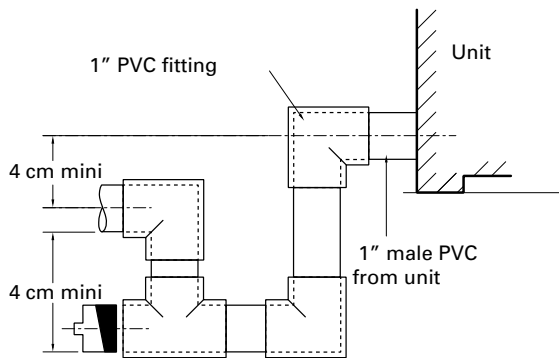
## Condensate drain piping

A 1 inch NPT female condensate drain connection is provided on the same side of the unit as the evaporator section access panel on downflow units. On horizontal units, the condensate drain connection is located on the corner of the unit next to the evaporator section access panel. Units with model numbers 200 and 250 have two drain connections. When it has been determined which connection will be used, the remaining one should be plugged with a field provided 1" nipple. A trap should be installed and filled with water before starting the unit to avoid air from being drawn through. Follow local codes and standard piping practices when running the drain line. Pitch the line downward, away from the unit, and avoid long horizontal runs. See figure 4.

Do not use reducing fittings in the drain lines. The condensate drain must be :

- Made of 1" pipe size.
- Pitched 2% to provide free drainage to convenient drain system.
- Trapped.
- Must not be connected to closed drain system.

**Figure 5 : Condensate drain line connection**



## Filter installation

To gain access to filters, remove the evaporator fan access panel on downflow units, and the filter access panel on the end for horizontal units. Each unit ships with 2.5 or 5 cm filters. Number and size of filters is determined by size and configuration of the unit.

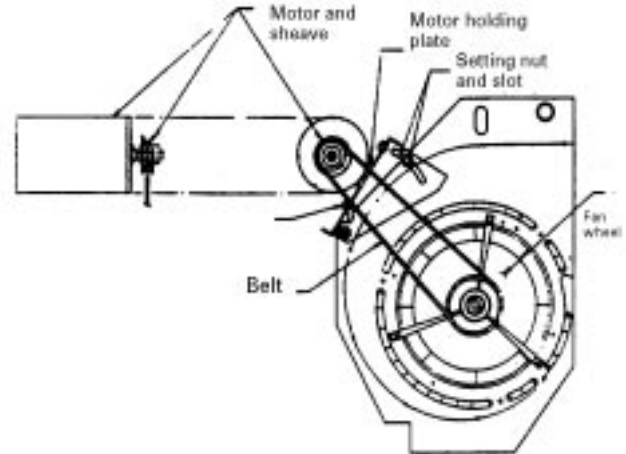
**Important note** : Do not operate unit without filters in place.

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

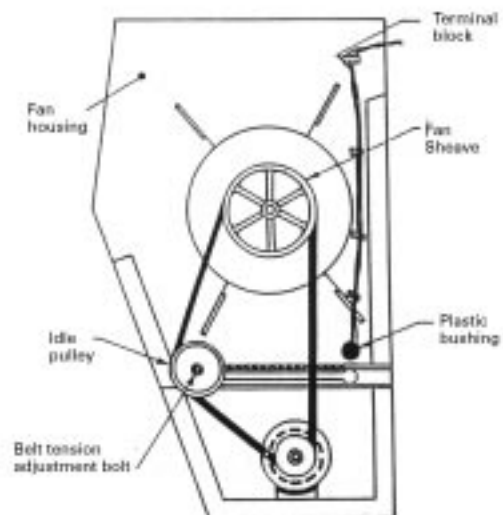
- 1) Déterminer la pression statique externe totale du système avec les accessoires.
  - a) Obtain the design airflow rate and the design external static pressure drop through the distribution system.
  - b) Add static pressure drop of the accessories installed on the unit.
  - c) Add the total accessory static pressure drop (from step 1b) to the design external static pressure (from step 1a). The sum of these two values is the total system external static pressure.

- 2) Using the table(s) in the selection data to find the external static pressure that most closely approximates total system external static pressure. Then locate the appropriate airflow rate for your unit. The value obtained represents the brake horsepower for the evaporator fan motor and the fan RPM.

**Figure 6 : Typical fan, motor, and sheave assembly (060-075)**



**Figure 7 : Typical fan, motor, and sheave assembly (085 to 250)**



## To increase airflow

Loosen turn open set screw and turn sheave clockwise

## To decrease airflow

Loosen turn open set screw and turn sheave counterclockwise.



### 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.

### Control wiring

The control circuit is 24 volts.

**Caution.** The unit's disconnect switch must be opened and locked open. Risk of injury and electrocution.

**Note.** The unit's 24 V transformer must not be used to power accessories mounted on site, other than those that are factory-mounted.

### Unit controlled by thermostat

Install the electrical link between the thermostat (thermostat terminal strip) and the unit (LTB terminal strip) in compliance with the interconnection diagram.

The low voltage wiring must not be laid in the same pipes as the power cables.

The sizes and lengths of the thermostat connection cables are given in table 5. The total resistance of these control cables must not exceed 5 ohms. If the resistance exceeds this value the thermostat may not operate with the same precision.

**Table 5 : Zone sensor wire size and maximum length**

Wire size (mm <sup>2</sup> )	Maximum wire length (m)
0,33	45
0,50	76
0,75	115
1,30	185
2,00	300

### Unit controlled by BAS

Each unit must be equipped with a TCI3 board.

A communication bus (twisted shielded pair) must link each TCI3 to the Trane Roof Top Manager (RTM) or to the communication gateway (in the case of an external BAS).

Connect one temperature sensor to each unit.

### Unit controlled by TRACKER supervisor

The units must also be equipped with the TCI3 communication board. One remote sensor is required on each unit for a constant flow volume. In the case of a variable flow installation (Varitrac) these sensors must not be installed.

A twisted shielded pair must be used for the communication link.

The main functions of the Tracker supervisor are control of set points, timetable management (Programming) and display of faults.

For more details refer to the supervisor documentation.

**Table 6 : Electrical data**

	Compressor(s)		Indoor fan		Outdoor fan(s)	
	Nominal amps*	Starting amps*	Maxi amps	Starting amps	Maxi amps**	Starting amps**
YCD/YCH 060	9,7	64	3,2	32,2	2,4	5,4
YCD/YCH 075	12,2	79	3,2	32,2	2,4	5,4
YCD/YCH 085	10,0	71	3,4	23,6	2,9	9,3
YCD/YCH 100M	10,0	71	4,8	40,5	2,9	9,3
YCD/YCH 100H	10,0	71	3,4	23,6	2,9	9,3
YCD/YCH 120	10,6	64	4,8	40,5	2,9	9,3
YCD/YCH 150	12,7	79	4,8	40,5	1,6	4,0
YCD/YCH 175	14,5	90	7,6	54,9	2,9	9,3
YCD/YCH 200	17,4	104	7,6	54,9	3,0	9,3
YCD/YCH 250	17,7	104	11,0	65,2	3,0	9,3

\* Amps per compressor

\*\* Amps per fan

**Table 7 : Gas burner fan**

	Max. Amp.	Starting Amp.
G150A	0,5	0,78
G205A	0,4	1,40
G250A	0,8	2,00
G350A	0,8	2,00
G400A	0,8	2,00

## Connection of accessories installed on site

**Smoke detector.** In certain cases legislation requires installation of a smoke detector at the beginning of the discharge duct. It closes the intake flap, opens the fresh air flap and stops the fan (electrical link: remove the bridge between X5 and X6).

**Economizer.** Refer to the economizer's documentation or assembly drawing. The unit housing the economizer is pre-wired for connection of the electronic module (UEM). Install and connect the two temperature sensors (discharge and intake) and the two humidity sensors (intake and fresh air hood).

**Motorized hood.** Wiring is the same type as the economizer, but without the sensors.

**Oversize drive.** The basic fan-motor's power supply cables big enough to allow the oversize drive motor to operate. The magneto-thermal overload relay's activation threshold must be adjusted.

## 3D-Scroll compressors (available on YCD/YCH 200-250)

Compressor electrical phasing

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

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. The direction of rotation may be reversed by interchanging any two of the line wires. It is this possible interchange of wiring that makes a phase sequence indicator necessary if the operator is to quickly determine the phase rotation of the compressor motor.

The "ABC" indicator on the face of the phase indicator will glow if phase is ABC for terminals L1, L2, L3.

**Important :** After completion of wiring, check all electrical connections, 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 R-22 in the compressor. It is recommended the crankcase heaters be energized for 8 hours prior to starting.

**Caution :** Units with 3D-Scroll compressors are not equipped with crankcase heaters.

## F - Connection of duct network

### 1) Downflow discharge units (YCD) - Using the rooftop curb

- The rooftop curb must be insulated on the outside walls at the discharge and intake openings to prevent condensation in the ducts.

- The rims around the discharge and intake openings make it possible to attach the flanges on the ends of the ducts. If you are using rigid duct ends recommended on the rooftop curb plan, it is essential to fix these components before installing the unit.

- For the design of the duct network, comply with recommendations currently applicable on the market, in particular:

\* Installation of a section of flexible ducts to limit transmission of the unit's vibrations

\* Use of movable vanes or deflectors to reduce the sound level.

### 2) Horizontal discharge units (YCH)

- The intake and discharge ducts must be insulated (thermal insulation).

- The duct section located outside must be leaktight.

- Provide a flexible connector to prevent transmission of the unit's vibrations. This flexible duct must be installed inside the building.

## 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 a flexible pipe.

Provide a dust protection (filter) upstream the unit connection.

Leak-check the gas pipe using soap and water or any other equivalent method.

Look for gas pipe leaks using "Typol", "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 table 10.

**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 inlet could damage it.

## Operating principles of the gas heating module

The heating function of YC\* units is assured by a heating module Gyyy-y made of an exchanger and a gas burner. The burner, of the forced air type, has two capacity stages controlled by the UCP electronic controller which optimizes the air-conditioner operation.

The heat request detected by the zone temperature sensor starts the heating module. The normal cycle to start the heating module starts at the heat request detection.

The UCP module internal relay K5 energizes once its safety relay and the minimal gas pressure switch contact are made. It also energizes the contactor (K70) of the burner fan (2M70) and the ignition control modul (IGN).

The relay K5 switches forcing the burner fan into high speed. After approximately 1min, the relay K5 switches back and the burner fan (2M70) changes into low speed.

The ignition control module pre-heats the ignition probe (IP) during approximately 36 second. 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 succesfully, the IP probe is de-energized and maintains a flame detection function.

If the ambient temperature remains below the first stage heating setpoint for 90 sec 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 room to be heated has reached the setpoint, the UCP de-energizes the relays K5, K70 and the IGN ; the burner then stops.

If the supply air fan (4M46) is in the automatic operating mode, it will start a few seconds after the heat request detection.

In the same manner, it will stop 1 min 30s 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 either to isolate the unit with the main disconnect switch or to cancel the heat request by changing the ambient temperature thermostat setpoint.

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 (B70)
- 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 exchanger (TC02) TC01 and TC02 are automatic reset thermostats, however, they are put into service with the relay K2 located in the unit control panel. Any untimely trip-out of this relay requires the intervention of a qualified technician to diagnose the causes of the apparent default.

**Table 8 - State of LEDs on gas-fired heating module**

Diagnosics	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 technician who has read the following procedure beforehand, or preferably has undergone the training course on Trane gas burners.

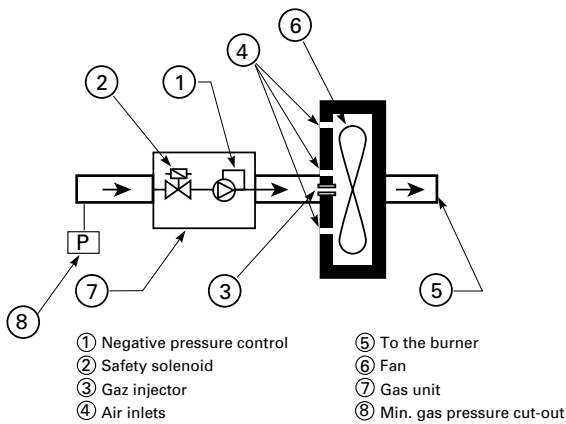
Before performing ignition tests it is first necessary to perform the following operations:

- Check a gate valve is present
- Check 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.

**Figure 8**

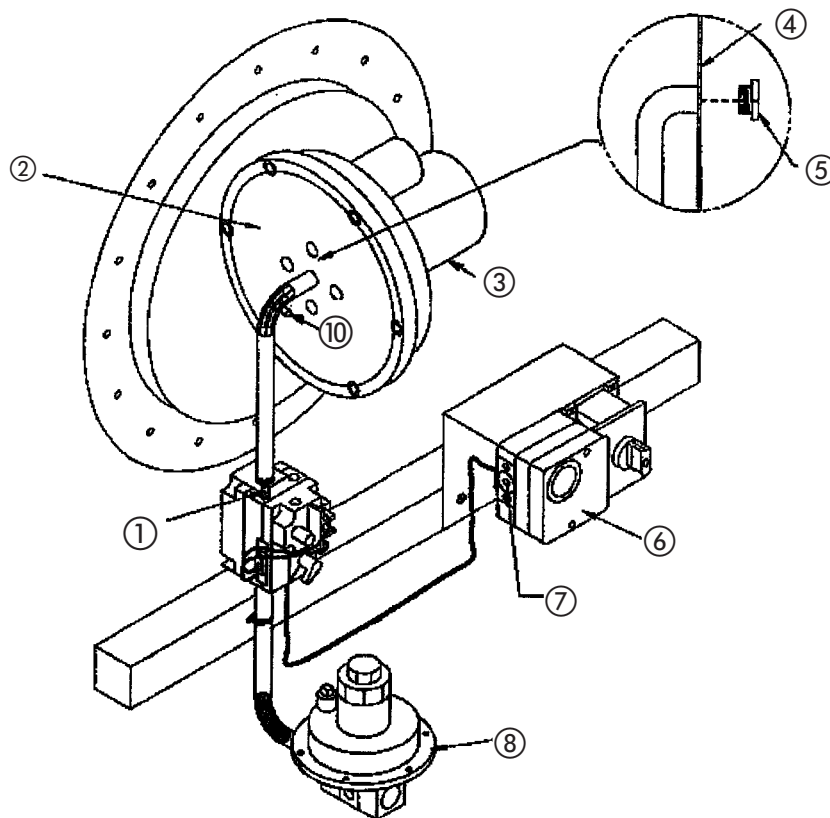


- Check the pressure upstream of the gas unit (the pressure connection is located on the minimum gas pressure cut-out). This cut-out must be set to 15 mbar. This operation must be carried out while the burner is NOT OPERATING.
- Check the power supply voltage is present at the T2-2 transformer output:
  - \* 115 volts for power supply of the IGN module (L1-L2 and S1-S2).
  - \* 230 volts for power supply of the burner fan-motor.

- Measure the negative pressure downstream of the gas unit. Connect a flexible hose to the gas unit branch connection (for sizes 060 and 075 the connection is located on the gas pipe) and connect an 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" terminals on the machine's 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.

**Detail of the gas section**

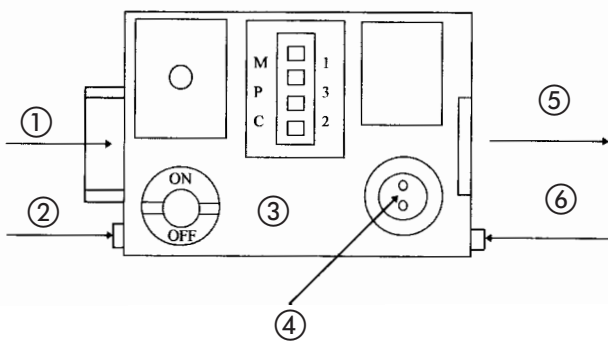


- ① Negative pressure connection (sizes 085-250). See ⑩ for sizes 060-075
- ② Mesh plate
- ③ Fan-motor unit
- ④ Mesh plate
- ⑤ Injector
- ⑥ Min. gas pressure cut-out
- ⑦ Gas pressure connection
- ⑧ Limiter (propane only)

## When the measured partial vacuum is positive (above atmospheric pressure) or zero

- 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 10).
- To increase the partial vacuum turn the screw anti-clockwise.
- Measure the partial vacuum again while the burner is operating.
- When the adjustment is finished, seal the brass threaded plug with paint.

Figure 10



- |  |  |
|--|--|
| ① Gas inlet                                    | ⑤ Gas outlet   |
| ② Pressure connection<br>Min. pressure cut-out | ⑥ Downstream pressure<br>connection (except sizes<br>060 et 075) |
| ③ Gas unit                                     |  |
| ④ Brass screw                                  |  |

It is highly recommended to check the combustion gases with a flue gas analyser. The measured values must be within the following ranges:

- Carbon monoxide (CO) less than 50 PPM
- Oxygen (O<sub>2</sub>) greater than 1.5%
- Carbon dioxide (CO<sub>2</sub>) less than 11%.

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

### Checking the correct operation of the burner safeties

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

- 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 B70 cut-out must open and stop all the gas supply chain components (fan, gas valve, ignition controller). Any attempt to ignite the system again must fail.
- 2) Open the main gas valve, the pressure switch B70 should automatically reset. The burner can now be put back into operation.
- 3) Ignite the burner. once it is burning, simulate a flame ailure by disconnecting a wire of the flame detection sensor (quick connect). The ignition controller should stop immediately the burner and close the gas valve.

- 4) Re-connect the sensor and re-ignite the burner. Once the burner is ignited, simulate an air default by disconnecting a wire from the sensor TC01. The relay K2 should open and stop all the burner's elements (fan, gas valve and ignition controller should no longer be energized). Reconnect the TCO1 connection. Despite the heating demand the burner does not start again, provided the D70 timer has not reached its activation point.
- 5) Once the burner is ignited, simulate overheating by disconnecting a wire from the sensor TC02. The relay K2 should open and stop all the burner's elements (fan, gas valve and ignition controller should no longer be energized). Reconnect the TC02 wire.

### Adaptation to available gases (see table 9)

The gas-fired heating modules Gyyy-y built into YC\* 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 gas to G31 gas** requires the following modifications.

- Change of the gas intake orifice in the burner's fan.
- Implementation of a pressure limiter.

**Warning.** The orifice and the limiter for supply with gas G31 must be manufactured by TRANE.

### Start up

#### Operating checks list before the start-up

- Unit is level, with sufficient clearance all round
- Duct network is correctly dimensioned according to the unit configuration, insulated and water-tight,
- Condensate drainage line is correctly dimensioned, equipped with a 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 procedure.

**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 9 : Units equipped with gas heating modules, CE marked**

Sales reference	Heating module				
	G150	G205	G250	G350	G400
<b>Rooftop air conditioner</b>	<b>Gas module heating capacity kW PCI (output %)</b>				
<b>50 Hz EEC Voyager</b>					
<b>G20</b>	26,0 (88%)	41,4 (92%)	49,1 (91%)	70,6 (90%)	77,4 (91%)
<b>G25</b>	22,8 (86%)	35,0 (92%)	38,3 (89%)	59,4 (88%)	60,3 (90%)
<b>G31</b>	24,4 (87%)	37,7 (92%)	48,6 (90%)	57,3 (88%)	78,2 (92%)
YC*060S4H...		X			
YC*075S4H...		X			
YC*085S4H...		X			
YC*100S4M...		X			
YC*100S4H...			X		
YC*120S4L...	X				
YC*120S4H...			X		
YC*150S4L...			X		
YC*150S4H...				X	
YC*175S4L...			X		
YC*175S4H...				X	
YC*200S4L...			X		
YC*200S4H...					X
YC*250S4L...			X		
YC*250S4H...					X

\* = "H" for horizontal air discharge ; "D" for vertical downflow air discharge.



**Table 10: Characteristics of G20, G25 and G31 gases used by gas-fired heating modules fitted to YC\* rooftop air-conditioners**

Module de chauffage		G150	G205	G250	G350	G400
<b>Natural gas G20 (20mbar)</b>						
<b>34,02 MJ/m3 (15°C-1013 mbar)</b>						
Injector diameter	(mm)	6,05	7,67	8,20	9,80	10,69
Heating capacity	(kW)	26,0	41,4	49,1	70,6	77,4
Min gas pressure (trip-out)	(mbar)	15,0	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	9,0
Heat rate	(kW)	29,5	45,0	54,0	78,7	85,0
Reduced rate						
Gas flow (15°C-1013 mbar)	(m³/h)	3,0	4,6	5,1	8,1	8,5
Heat rate	(kW)	28,2	43,5	48,0	76,8	80,0
<b>Natural gas G31 (30. 37 ou 50 mbar)</b>						
<b>88,00 MJ/m3 (15°C-1013 mbar)</b>						
Injector diameter	(mm)	6,05	7,67	8,20	9,80	10,69
Heating capacity	(kW)	22,8	35,0	38,3	59,4	60,3
Min gas pressure (trip-out)	(mbar)	15,0	15,0	15,0	15,0	15,0
Normal rate						
Gas flow (15°C-1013 mbar)	(m³/h)	3,3	4,7	5,3	8,3	8,2
Heat rate	(kW)	26,5	38,0	43,0	67,4	67,0
Reduced rate						
Gas flow (15°C-1013 mbar)	(m³/h)	3,1	4,5	4,9	7,8	7,9
Heat rate	(kW)	25,0	36,5	40,0	63,4	64,0
<b>Natural gas G31 (30, 37 ou 50 mbar)</b>						
<b>88,00 MJ/m3 (15°C-1013 mbar)</b>						
Injector diameter	(mm)	4,98	5,40	6,76	7,37	8,50
Heating capacity	(kW)	24,4	37,7	48,6	57,3	78,2
Min. gas pressure (trip-out)	(mbar)	20,0	20,0	20,0	20,0	20,0
Normal rate						
Gas flow (15°C-1013 mbar)	(m³/h)	1,1	1,7	2,2	2,7	3,5
	(kg/h)	2,2	3,2	4,2	5,1	6,6
Heat rate	(kW)	28,0	41,0	54,0	65,3	85,0
Reduced rate						
Gas flow (15°C-1013 mbar)	(m³/h)	1,1	1,6	2,2	2,6	3,2
	(kg/h)	2,1	3,0	4,1	4,9	6,1
Heat rate	(kW)	26,4	38,5	53,0	62,6	78,0
<b>Combustion air flow</b>	(m³/h)	38,0	60,0	72,0	98,0	113,0
(Avec E=25%)						

**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
2L3P	2E + 3P	I2E + I3P	2H3P	I2H + (Natural gas only)	I2E I3P
G20 - 20 mbar					G 25
G25 - 25 mbar				20 mbar	
G 31	G 31 - 37 mbar			G 37	
30 mbar				50 mbar	

Figure 11 : Trane Gyyy-y gas heating module ignition controller start and safety sequence

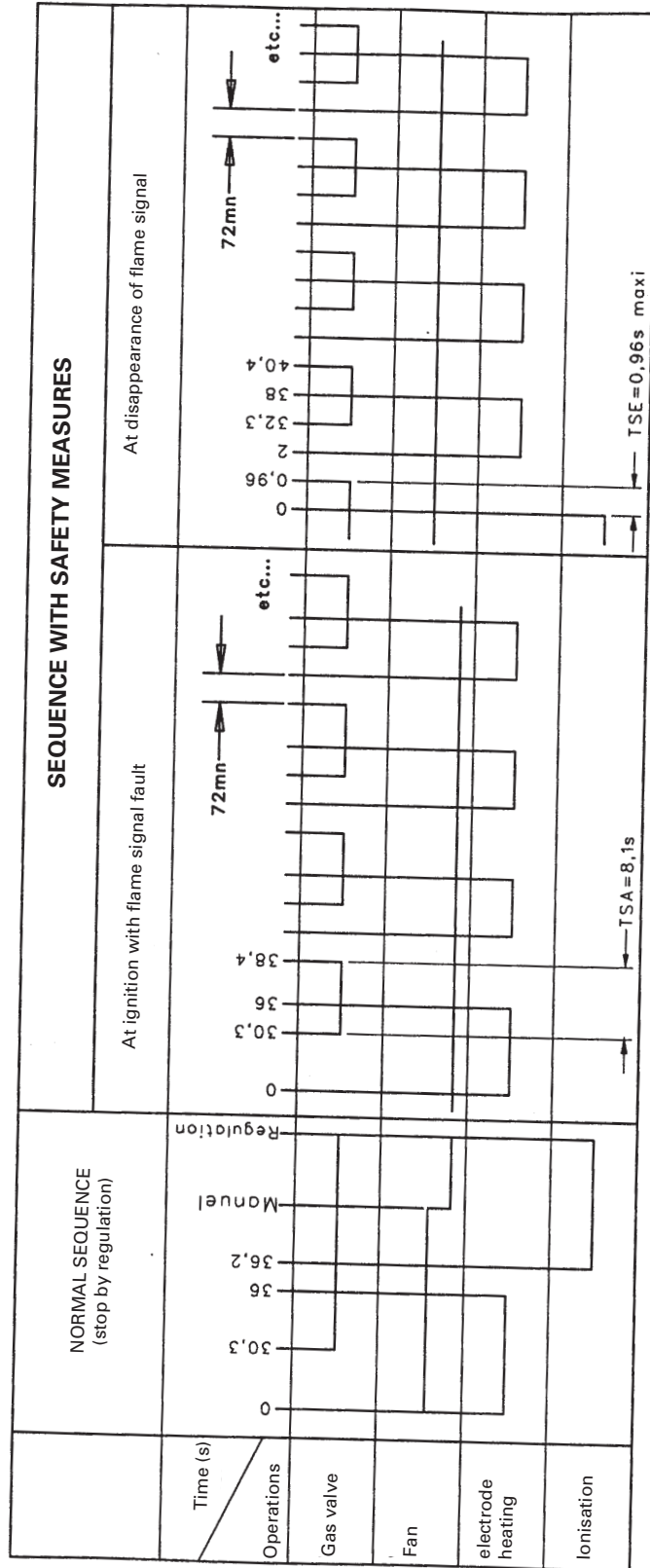
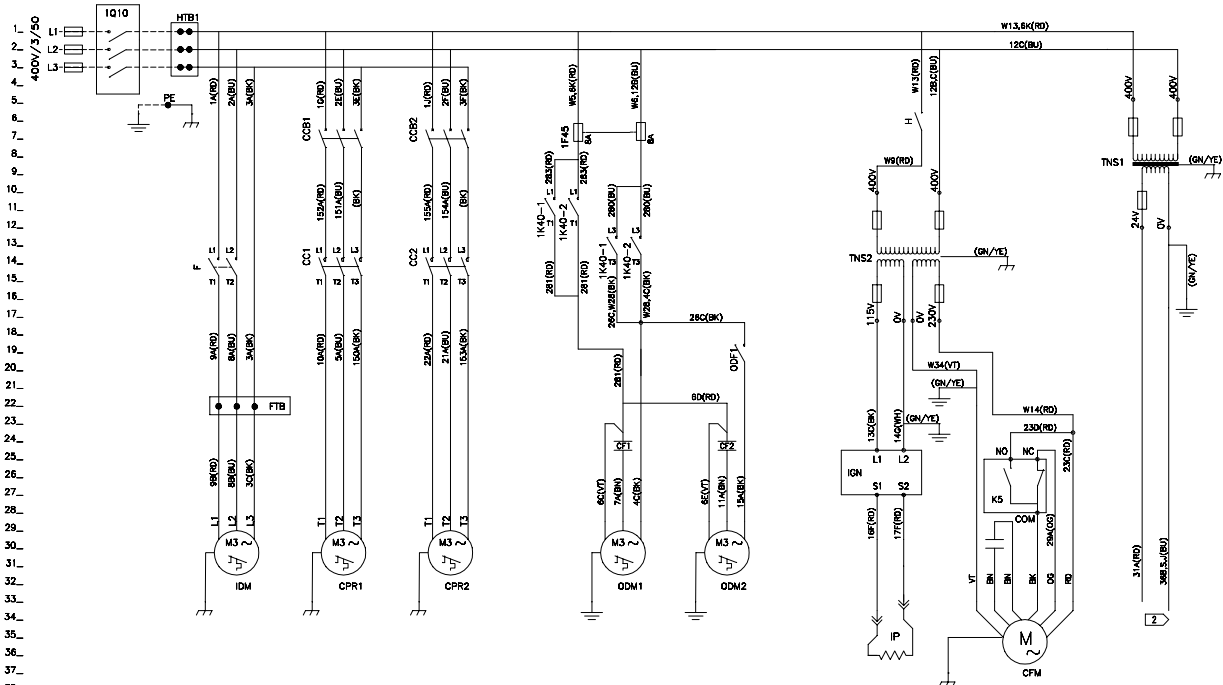


Figure 12 : Basic electrical diagram of gas-fired heating module control system

---	CABLAGE TRANE	TRANE VERDRÄHTUNG	TRANE WIRING
---	CABLAGE CLIENT	VERDRÄHTUNG DURCH KUNDEN	CUSTOMER WIRING
---	CABLAGGIO TRANE	DOOR TRANE BEDRAAD	CABLEADO TRANE
---	CABLAGGIO CLIENTE	DOOR KLANT BEDRAAD	CABLEADO CLIENTE

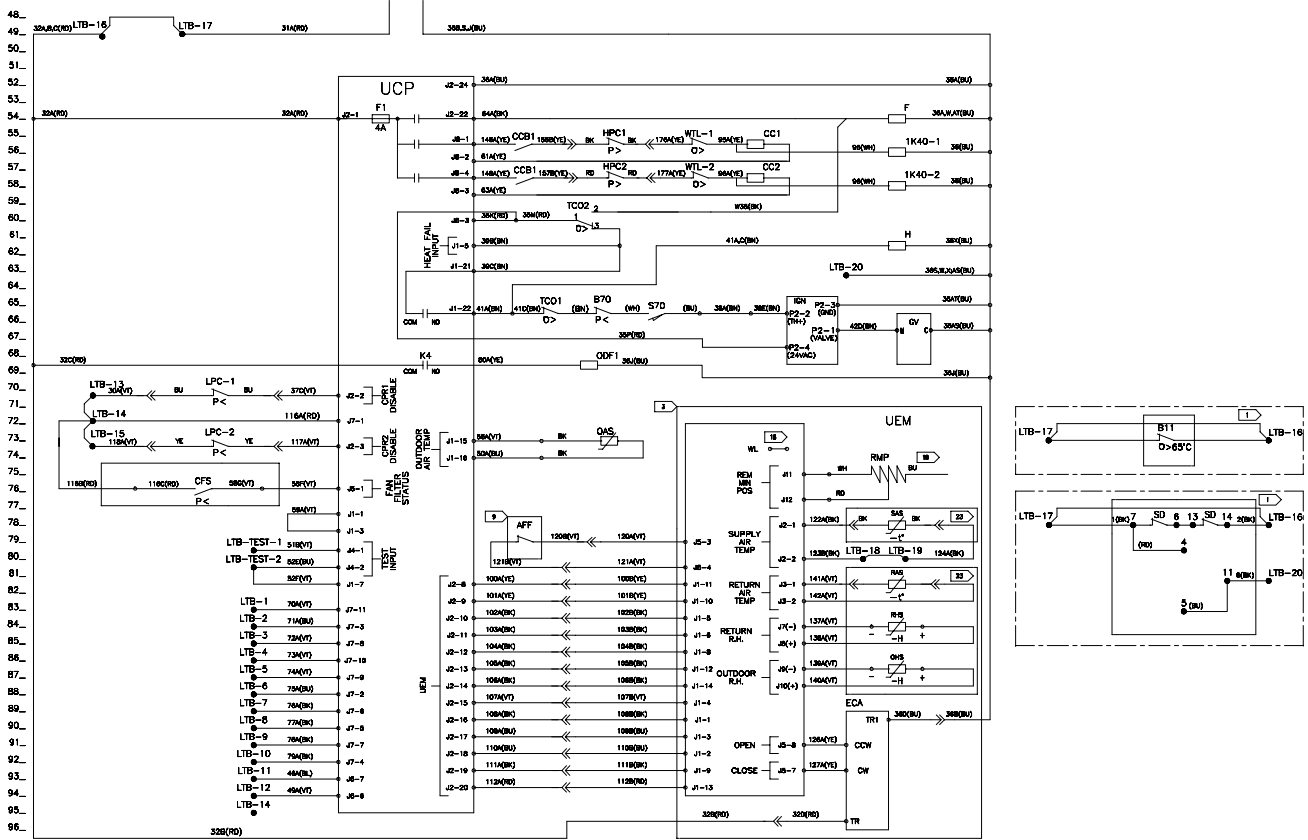


CODE COULEUR FARBMARKIERUNG COLOUR CODE	CODE COULEUR FARBMARKIERUNG COLOUR CODE	CODE COULEUR FARBMARKIERUNG COLOUR CODE	CODE COULEUR FARBMARKIERUNG COLOUR CODE
BK: NOIR	SCHWARZ	BLACK	BK: NERO
BN: BRUN	BRAUN	BROWN	BN: MARRONE
BL: BLEU	BLAU	BLUE	BL: BLAU
GD: OR	GOLD	GOLD	GD: ORO
GN: VERT	GRÜN	GREEN	GN: VERDE
GY: GRIS	GRAU	GRAY	GY: GRIGIO
OC: ORANGE	ORANGE	ORANGE	OC: ARANCIONE
RO: ROSE	ROSE	ROSE	RO: ROSA
RD: ROUGE	ROT	RED	RD: ROSSO
SR: ARGENT	SILBER	SILVER	SR: ARGENTO
VT: VIOLET	VIOLETT	PURPLE	VT: VIOLA
WH: BLANC	WEISS	WHITE	WH: BIANCO
YE: JAUNE	GELB	YELLOW	YE: GIALLO

ITEM	FRANCAIS	DEUTSCH	ENGLISH
AFF	DEFAULT VENTILATEUR	VENTILATORSTORUNG	ACTIVE FAN FAILURE
B11	THERMOSTAT INGENDIE	THERMOSTAT FEUER	FIRE THERMOSTAT
D70	PRESSOSTAT PRESSION MINI GAZ	MINDESTGASDRUCKSCHUTZSCHALTER	MINIMUM PRESSURE GAS CONTROL
CC1, CC2	CONTACTEUR DEMARRAGE COMPRESSEUR	SCHLEZ, ANLAFV ERDICHTER	COMPRESSEUR CONTACTOR
CH 1, 2	RESISTANCE CHAUFFAGE HUILE	OEIHEIZUNG, VERDICHTER	COMPRESSOR OIL HEATER
CF 1, 2	CONDENSATEUR	KONDENSATOR	CAPACITOR
CFM	MOTEUR VENTILATEUR BRULEUR	BRENNERGEBLAESMOTOR	COMBUSTION FAN MOTOR
CPS	PRESSOSTAT ENGROSSEMENT FILTRES	DRUCKSCHALTER, FILTERVERSCHMUTZ.	CLOGGED FILTER PRESSOSTAT
CPR 1, 2	MOTEUR COMPRESSEUR	MOTOR, VERDICHTER	COMPRESSOR MOTOR
ECA	MOTEUR ECONOMISEUR	ECONOMISER MOTOR	ECONOMIZER MOTOR
F	CONTACTEUR VENTIL. INTERIEUR	SCHLEZ, MOTOR VENTILATOR	CONTACTOR, INDOOR FAN MOTOR
F1	FUSIBLE PLATINE UCP	SICHERUNGSMODUL UCP	UCP MODULE FUSE
FTB	BORNIER PUISSANCE VENTILATEUR INT.	KLEMMEN, HAUPTSTROM VENTILATOR	FAN POWER CIRCUIT TERM. STRIP
IF45	FUSIBLE MOTEUR VENTILATEUR	SICHERUNG, MOTOR VENTILATOR	FAN MOTOR FUSE
GV	VANNE GAZ	GASVENTIL	GAS VALVE
H	RELAIS MOTEUR BRULEUR	BRENNER MOTOR RELAIS	BURNER MOTOR RELAY
HPC	PRESSOSTAT HAUTE PRESSION	DRUCKSCHALTER, HOCHDRUCK	HIGH PRESSURE CONTROL
IDM	MOTEUR VENTILATEUR BRULEUR	MOTOR, INNENVENTILATOR	INDOOR FAN MOTOR
IGN	BORNIER PUISSANCE	KLEMMEN, HAUPTSTROM	POWER TERMINAL BLOCK
IGM	MODULE DE CONTROLE DE COMBUSTION	ZUENDSTEUERMODUL	IGNITION CONTROL MODULE
IP	BOUCLE D'ALLUMAGE	ZUENDELEKTRODE	IGNITION PROBE
K5	RELAIS MODE CHAUD	HEIZEN RELAIS	HEATING RELAY
1K40	CONTACTEUR VENTILATEUR	SCHLEZ, VENTILATOR	FAN CONTACTOR
LTB	BORNIER RACCORDEMENT EXTERIEUR	AUSSEN KLEMMEN	LOW VOLTAGE STRIP
LPC	PRESSOSTAT BASSE PRESSION	DRUCKSCHALTER, NIEDERDRUCK	LOW PRESSURE CONTROL
OAS	SONDE D'AIR EXTERIEUR	FUELER, AUSSENTEMPERATUR	OUTSIDE AIR SENSOR
ODF 1	RELAIS VENTILATEUR EXTERIEUR	RELAIS, BETRIEB VENTILATOR	OUTDOOR FAN RELAY
ODM	MOTEUR VENTILATEUR CONDENSEUR	MOTORVENTILATOR, VERFLUESSIGER	CONDENSER FAN MOTOR
OHS	SONDE D'HUMIDITE EXTERIEURE	AUBEN-FEUCHTEFUEHLER	OUTDOOR HUMIDITY SENSOR
IQ10	INTERRUPTEUR SECTIONNEUR UNITE	TRENNER MASCHINE	DISCONNECT SWITCH
RAS	SONDE RETOUR D'AIR	RUECKLUFTFUEHLER	RETURN AIR SENSOR
RHS	SONDE RETOUR D'HUMIDITE	RUECKLUFT-FEUCHTEFUEHLER	RETURN HUMIDITY SENSOR
RMP	POTENTIOMETRE EXTERNE POSIT. MINI	EXTERNES POTENTIOMETER	REMOTE MINIMUM POSITION
SAS	SONDE ENTREE D'AIR	LUFTAUSTRITTSFUEHLER	SUPPLY AIR SENSOR
SD	DETECTEUR DE FUMEE	RAUCHMELDER	SMOKE DETECTOR
S70	INTERRUPTEUR BRULEUR	BRENNERUNTERBRECHER	BURNER SWITCH
TNS1	TRANSFORMATEUR CONTROLE	TRANSFORMATOR KONTROLLE	CONTROL TRANSFORMER
TNS2	TRANSFORMATEUR CIRCUIT GAZ	TRANSFORMATOR K+FUER GASKREIS	IGNITION TRANSFORMER
TCO-1	THERMOSTAT SECURITE TEMP. BRULEUR	BRENNERTEMP.-SICHERHEITSSCHAL.	BURNER HIGH LIMIT CUTOFF
TCO-2	THERMOSTAT SECURITE TEMP. SOUFFLAGE	SICHERHEITSTHERM.; ZULUFTTEMPERAT.	FAN FAILURE LIMIT
UCP	MODULE DE REGULATION UNITE	ELECTRONIKMODUL	UNIT CONTROL MODULE
UEM	MODULE CONTROLE ECONOMISEUR	ECONOMISER-STEUERMODUL	UNITARY ECONOMIZER MODULE
WTL	CONTROLE TEMP. COMPRESSEUR	TEMPERATURSCHALTER, VERDICHTER	COMPRESSOR TEMPERATURE CONTROL

- 1 - OTER LE PONT POUR RACCORDER L'OPTION REQUISE
- 2 - BRUCKE ENTFERNEN UN DAS ENTSPRECHENDE ZUBEHÖR ANZUSCHLIESSEN
- 3 - REMOVE THE SHUNT FOR THE OPTION SHOWN
- 4 - RACCORDEMENT AVEC L'OPTION ECONOMISEUR/ HOTTE MOTORISEE
- 5 - ANSCHLUSS MIT OPTION EKONOMISERS/ MOTORGETRIEB. FRISHLUFTHAUBE
- 6 - CONNECTIONS WITH ECONOMIZER/ MOTORIZED OUTSIDE AIR OPTION
- 7 - PAS UTILISER
- 8 - NICHT VERWENDET
- 9 - NOT USED
- 10 - COUPER LE PONT "WL" POUR RACCORDER L'OPTION REQUISE (RMP)
- 11 - BRÜCKE "WL" ZWISCHEN UN DAS ENTSPRECHENDE ZUBEHÖR (RMP) ANZUSCHLIESSEN
- 12 - CUT THE WIRE LOOP "WL" FOR THE OPTION SHOWN (RMP)
- 13 - PAS UTILISER SUR HOTTE MOTORISEE
- 14 - NICHT VERWENDET MIT MOTORGETRIEBENE FRISHLUFTHAUBE
- 15 - NOT USED WITH MOTORIZED OUTSIDE AIR OPTION

Figure 12 : (continued)



ITEM	ITALIANO	NEDERLANDS	ESPAÑOL
AFF	GUASTO VENTILATORE	FOUTMELDING VENTILATOR	FALLO VENTILADOR
B11	TERMOSTATO INCENDIO	THERMISCHE BRANDMELDER	TERMOSTATO INCENDIO
B70	PRESSOSTATO DI SICU-MINI GAS	MINIMALE GASDRUKREQUELAAR	PRESSOSTATO DE SECU-MINI GAZ
CC1,CC2	CONTATTATORE AVVIAMENTO COMP.	COMPRESSOR START MAGNEETSCHAKEL	CONTACTOR ARRANQUE COMPRESOR
COH 1, 2	REGOLATORE OLIO COMPRESSORE	COMPRESSOR OUEVERWARMING	RESISTENCIA ACEITE COMPRESOR
CF1	CONDENSATORE	CONDENSATOR	CONDENSADOR
CFM	MOTORE VENTILATORE BRUCIATORE	VERBRANDER VENTILATOR MOTOR	MOTOR DEL VENTIL. DE COMBUSTION
CFS	PRESSOSTATO PER FILTRI PRESSOSTAAT	VERVUILD FILTER PRESSOSTAAT	PRESSOSTATO DE FILTROS SUCIOS
CFR 1,2	MOTORE COMPRESSORE	COMPRESSORMOTOR	MOTOR COMPRESOR
ECA	MOTOR ECONOMIZZATORE	ECONOMISER MOTOR	MOTOR ECONOMIZADOR
F	CONTATTATORE VENTILATORE INTERNA	MAGNEETSCHAKELAAR BINNENVENTIL.	CONTROL TEMP. VENTILADOR INTER.
F1	FUSIBILE CIRCUITO UCP	STUURSTROOMBEVEILIGING UCP	FUSIBLE DE CIRCUITO UCP
FTB	TERMIN. LINEA CIRC. POT. VENT.	VENTILATORMOTOR KLEMMENSTROOK	REGLETA CONEX. FUERZA VENTILADOR
IF45	FUSIBILE MOTORE VENTILATORE	VENTILATORMOTOR BEVEILIGING	FUSIBLE MOTOR VENTILADOR
GV	VALVOIA GAS	GASKLEP	VALVULA DE GAS
H	CONTATTATORE MOTORE BRUCIATORE	MOTOR BRANDER SCHAKELAAR	CONTACT. DEL MOTOR DEL QUENADOR
HPC	PRESSOSTATO ALTA PRESSIONE	HOGEDRUKPRESSOSTAAT	PRESSOSTATO DE ALTA
HTB1	TERMINALE LINEA CIRCUITO POTENZA	KRACHTSTROOM KLEMMENSTROOK	REGLETA CONEXIONES FUERZA
IDM	MOTORE VENTILATORE INTERNO	BINNENLUCHT VENTILATOR	MOTOR VENTILADOR AIRE INTERIOR
IGN	MODULO DI CONTROL COMBUSTIONE	REGLMOJUUL ONTSTeking	MODULO DE CONTROL DE IGNICION
IF	ELETTRODO DI ACCENSIONE	VOKLER ONTSTeking	LLAMA PILOTO
K5	RELE RISCALDAMENTO	VERWARMINGSRELAIS	RELE MODO CALOR
1K40	CONTATTATORE VENTILATORE	VENTILATOR MAGNEETSCHAKELAAR	CONTACTOR VENTILADOR
LTB	MORSETTIERA ESTERNA	KLEMMENSTROOK BUITEN	RACORES DE CONEXION EXTERIOR
LPC	PRESSOSTATO BASSA PRESSIONE	LAGEDRUKPRESSOSTAAT	PRESSOSTATO DE BAJA PRESION
GAS	SONDA TEMPERATURA ARIA ESTERNA	OMGEBINGSTEMPERATUUROPNEMER	SONDA TEMP. DEL AIRE EXTERIOR
ODF1	RELE FLUNZION. VENTILATORE	MAGNEETSCHAKELARELAIS	RELE MARCHA VENTILADOR
ODM	MOTORE VENTILATORE CONDENSATORE	CONDENSORVENTILATORMOTOR	MOTOR VENTILADOR CONDENSADOR
OHS	SONDA CONTROLLO UMIDITA ESTERNA	BUITENLUCHT VOCHTIGHEIOS SENSOR	SONDA DE HUMEDAD EXTERIOR
IQ10	SEZIONATORE UNITA	HOOFDSCHAKELAAR	SECCIONADOR UNIDAD
RAS	SONDA ARIA DI RIPRESA	RETOUURLUCHT SENSOR	SONDA DE AIRE DE RETORNO
RHS	SONDA CONTROLLO UMIDITA RIPRESA	RETOUURLUCHT VOCHTIGHEIOS SENSOR	SONDA DE HUMEDAD AIRE RETORNO
RMP	POTENZIMETRO A DISTANZA	MINIMUM POSITIE LUCHTSCHOEPEN	POTENTIOMETRO REMOTO
SAS	SONDA ARIA DI MANDATA	LUCHTTOEVOER SENSOR	SONDA DE AIRE DE IMPULSION
SD	RIVELATORE DI FUMO	ROOKDETEKTOR	DETECTOR DE HUMO
S70	INTERRUTTORE DEL BRUCIATORE	BRANDER SCHAKELAAR	INTERRUPTOR MECHERO DE GAS
TNS1	TRASFORMATORE	TRANSFORMATOR	TRANSFORMADOR
TNS2	TRASFORMATORE CIRCUITO GAS	TRANSFORMATOR GASCIJRCUIT	TRANSFORMADOR DEL CIRC. DE GAS
TCC-1	TERMOS. DI SIEUREZZA TEMP.BRUCIAT.	MAXIMAAL BEVEILIGING	TERMOST.DE SECUR DEL QUEMADOR
TCC-2	TERMOS. DI SIEUREZZA TEMP. VENTIL.	VENTILATOR BEVEILIGING	TERMOST. DE SECUR DEL VENTILADOR
UCP	MODULO REGOLAZIONE DELL'UNITA	MACHINEREGELMODUUL	MODULO REGULACION DE LA UNIDAD
UEM	MODULO CIR ECONOMIZZATORE	UNITARY ECONOMISER MODULE	MODULO DE CONTROL ECONOMIZADOR
WTL	REG.TEMPERATURA COMPRESSORE	COMPRESSORTEMPERATUUR BEVEILIG	CONTROL DE TEMPERATURA COMPRESOR

- |   |   |
|---|---|
| <p>1 &gt; -TOGLIERE IL PONTE PER IL COLLEGAMENTO CON L'OPZIONE RICHIESTA</p> <p>2 &gt; -VERWYDER DE SHUNT ZOALS DE OPTIE LAAT ZIEM</p> <p>3 &gt; -QUITAR EL PUENTE PARA LA OPCION MOSTRADA</p>  | <p>1 &gt; -VEDERE PAGINA 2 RIGA 48</p> <p>2 &gt; -ZIE BLAD 2 REGL 48</p> <p>3 &gt; -VER PAGINA 2 LINEA 48</p> |
| <p>3 &gt; -COLLEGAMENTO CON L'OPZIONE ECONOMIZZATORE/SERRANDA ARIA ESTERNA MOTOR.</p> <p>4 &gt; -AANSLUITING MET ECONOMISER/ BUITENLUCHT KAP OPTIE</p> <p>5 &gt; -CONEXION CON OPCION ECONOMIZADOR/COMPUERTA AIRE EXTERIOR MOTORIZADA</p> | <p>1 &gt; -NON UTILIZZARE</p> <p>2 &gt; -NIET IM GEBRUIK</p> <p>3 &gt; -NO USADO</p>                          |
| <p>1B &gt; -TAGLIARE IL PONTE "WL" PER IL COLLEGAMENTO CON L'OPZIONE RICHIESTA (RMP)</p> <p>2 &gt; -VERWYDER DE SHUNT "WL" ZOALS DE OPTIE LAAT ZIEM (RMP)</p> <p>3 &gt; -CORTAR EL PUENTE "WL" PARA LA OPCION MOSTRADA (RMP)</p>          |   |
| <p>23 &gt; -NON UTILIZZARE CON SERRANDA ARIA ESTERNAMOTORIZZATA</p> <p>24 &gt; -NIET IM GEBRUIK MET BUITENLUCHT KAP</p> <p>25 &gt; -NO USADO CON COMPUERTA DE AIRE EXTERIORMOTORIZADA</p>   |   |

# Operation

## Power-up initialization

The "initialization" by the 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. The UCP system indicator LED is turned to "ON" within one second of start-up if operation is correct.

**Important information :** Electrical phasing.

If electrical phasing is incorrect (indoor fan operating in reverse), several symptoms will be apparent :

- Unit will not properly heat or cool
  - Indoor fan (evaporator) will run backwards
- 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.

## Starting the unit in the heating mode

- Check to ensure all grilles and registers are open and all unit access doors are closed before start-up.
- Place the zone sensor system switch in the "Heat" position.
- Position the heating setpoint approximately 10 degrees above room temperature and place the fan switch in "AUTO" or "ON" position.
- Turn on unit main power supply.

**Note :** To bypass time delays, and verify the operation of the unit from the roof, use the "test mode procedure" in this manual.

## Heating shutdown

When running the unit using the zone sensor as the control, position the selector switch at "Off".

Do not de-energize main power disconnect except when unit is to be serviced. Power is required to keep the compressor crankcase warm and boil off refrigerant in the oil (except on units with 3D-Scroll compressors).

Set the zone sensor to the desired set-point.

## Starting the unit in the cooling mode

Verify that the unit airflow rate is adjusted according to information provided in "Determining evaporator fan adjustment" section of this manual.

To start the unit in the cooling mode,

- Place the zone sensor system switch in the COOL position.
- Position the cooling setpoint approximately 10 degrees below room temperature and place the fan switch in the "AUTO" or "ON" position.
- Turn on unit main power supply.

The condenser fan motor, compressor and evaporator fan motor should operate automatically. There will be a delay of up to 5 minutes before the unit will start in the cooling mode.

## 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 :** To bypass time delays and verify the operation of this unit from the roof, use the "Test mode procedure" in this manual.

Check the suction and discharge pressures and compare them to the normal operating pressures provided in the table 10.

**Note :** Always route refrigerant hoses through the port hole provided and ensure that the compressor access panel is in place.

## Cooling shutdown

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 may be a delay of up to 3 minutes before compressors shutdown 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 the compressor crankcase warm and boil off refrigerant in the oil (except on units with 3D-Scroll compressors).

## Compressor overload protection

**Warning :** Open and lock unit disconnect switch before servicing this equipment. Failure to do so could result in severe personal injury or death due to electrical shock or contact with moving parts.

**Important :** Models 200 and 250 are equipped with external compressor overload protection. When an overload is detected the overload(s) will trip and the UCP will lock out the compressor(s). When this happens, the overload(s) and the UCP must be reset. To reset the overload(s), open and close unit disconnect.

Remove the compressor access panel. It is not necessary to remove the control box cover. There are two holes in the upper right hand corner of the control box cover. Immediately inside these two holes are reset buttons (red in color). Reset the overload (s) by depressing the reset buttons. Replace the compressor access panel. Close unit disconnect switch to resume normal operations. Doing this will reset the UCP.

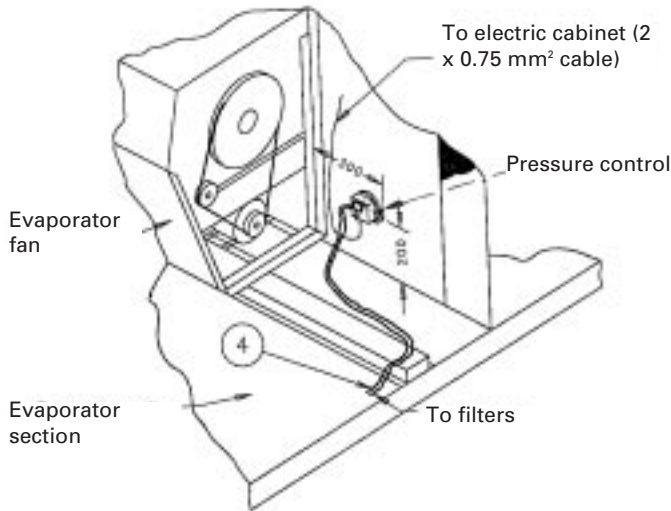
## Smoke detector

The smoke detector is not installed in the unit, its positioning is recommended at the duct entrance (in the frame for instance). Connection terminals are provided should this option would be required.

**Clogged filter detector (figure 9)**

This device is mounted in the indoor fan section. The detector measures the difference in pressure before and after the filter section. The clogged filter information is sent to the TPH03 thermostat, to a Tracker or to a BMS. The setting range is 40 to 300 Pa.

**Figure 12 : Clogged filter detector**

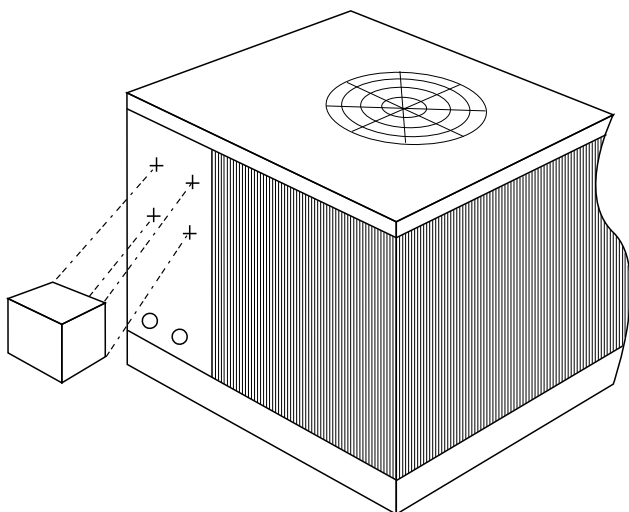


**Disconnect switch (figure 13)**

The disconnect switch is delivered pre-wired. It is located in the compressor section. Mount the disconnect switch onto the exterior of the unit, between the condenser coil and the electrical panel (near the unit top corner). Wire the disconnect switch from the power terminal block in the panel to the disconnect switch with the wire bundle provided by following the electrical diagram found in the unit.

**Note :** The disconnect switch is equipped with a pre control circuit disconnect contact.

**Figure 13 : Disconnect switch installation position**



**Table11 : Operating pressures (bar)**

	Nominal pressure (m³/h)	Cooling mode	
		Suction (bar)	Discharge (bar)
YCD/YCH 060	3500	5,1	19,2
YCD/YCH 075	4200	5,1	19,6
YCD/YCH 085	4850	5,0	20,6
YCD/YCH 100	5600	4,9	20,3
YCD/YCH 120	7140	5,1	20,0
YCD/YCH 150	8500	4,9	20,3
YCD/YCH 175	10030	4,8	20,0
YCD/YCH 200	11200	5,0	20,0
YCD/YCH 250	14100	5,3	19,3

at 35°C outdoor 23.3°C DB/16.7°C WB in cooling mode.

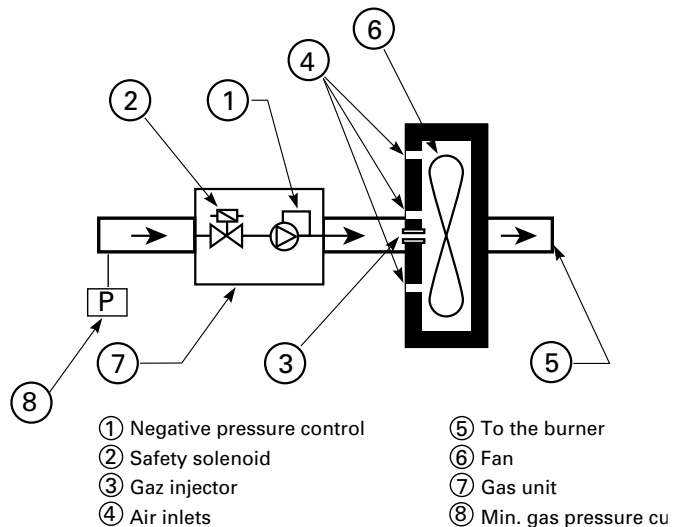
**Final installation checklist**

- Is the condenser fan and indoor blower operating correctly, ie : correct rotation and without undue noise ?
- Are the compressors operating correctly and has the system charge been checked ?
- Has the gas module been installed as per the procedure in this manual ?
- Have the voltage and running currents been checked to determine if they are within limits ?
- Have the air discharge grilles been adjusted to balance the system ?
- Has the ductwork been checked for air leaks and any condensation ?
- 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 or any unusual noises ?
- Are all covers and panels in place and properly fastened ?

**Burner skeleton diagram**

To avoid any ignition of the burner by the controller, open the disconnect switch S70 located in the burner compartment.

**Figure 14 : Trane gas heating module, type Gyyy- y principle diagram**





# Maintenance

## Routine maintenance (by the end user)

Some of the periodic maintenance functions for the unit can be undertaken by the end user ; this includes replacing (disposable) or cleaning (permanent) air filters, cleaning unit cabinet, clearing the condenser coil, and carrying out a general unit inspection on a regular basis.

**Warning :** Before removing access panels to service the unit, disconnect the power supply. Failure to disconnect power before attempting any servicing can result in severe injury or death.

## Air filters

It is very important that the central duct system air filters are kept clean. These should be inspected at least once a month when the system is in constant operation (in new buildings, the filters should be checked every week for the first 4 weeks).

If disposable type filters are used they should only be replaced with ones of the same type and size.

**Note :** Do not attempt to clean disposable filters.

Permanent type filters can be cleaned by washing with a mild detergent and water. Ensure that the filters are thoroughly dry before reinstalling them in the unit (or duct system).

**Note :** Replace permanent filters annually if washing fails to clean them, or they show signs of deterioration. Be sure to use the same type and size as were originally installed.

## Condenser coil

Unfiltered air circulates through the unit's condenser coil and can cause the coil's surface to become clogged with dust, dirt, etc... To clean the coil, brush the coil surface in the direction of the fins with a soft bristled brush. Keep all vegetation away from the condenser coil area.

## Maintenance (by the service technician)

### 1) Before the cooling season

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

1. Filters (cleaned or replaced).
2. Motors and drives checked.
3. Economizer gaskets replaced if necessary.
4. Condenser coils cleaned.
5. Safety controls checked.
6. Electrical components and wiring checked and connections tightened as necessary.
7. Condensate drain cleaned.
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.

### 2) Before the heating season

- Visually inspect the unit to ensure that the airflow required for the condenser coil is not obstructed from the unit.
- Inspect the control panel wiring to verify that all electrical connections are tight, and that wire insulation is intact.

### 3) Gas heating module maintenance (figure 14)

In addition to the current maintenance operations, (filter replacement...), a yearly maintenance must be made by a qualified engineer before the heating season.

### 4) Inspection of the state of the ignition electrode (flat electrode only)

Check the resistance across the terminals of the disconnected electrode. The value given must be between 50 and 150 ohms. If this is not the case, replace the electrode

**After the disconnect switch (S70) has been opened, the following operations must be made :**

- Visual inspection of the burner compartment and of the gas exhaust pipes to check they are clean.
- Visual inspection of the exhaust gas grilles to make sure there is no obstruction to the gas flow.
- Check the condition of the internal wires and connections.
- Open the combustion chamber exhaust panel. Inspect and clean the heat exchange tubes and the combustion chamber.
- Check the ignition system (close the disconnect switch S70). When the burner is operating, close the manual gas valve on the supply line, check the internal gas valve closes and that an ignition restart is attempted.

After each heating module maintenance operation, the quality of the combustion must be checked.

## TROUBLE-SHOOTING - REPAIR

Description	Operations	Causes	Solutions	Values
Smell of gas near the unit	Stop the unit	Gas leaks at the connections	<ul style="list-style-type: none"> <li>* Conduct a leak test using Typol</li> <li>* Repair the leak(s)</li> </ul>	
Unpleasant smells, fumes in the air processed at start-up.	Allow the unit to continue operating.	Residues of oil or leaktight seal around the heating element.	<ul style="list-style-type: none"> <li>* Prolonged operation will eliminate this problem</li> </ul>	
Smell of gas in the processed air	Stop the unit	Hole in the heating element	<ul style="list-style-type: none"> <li>* Check the state of the heating element and tubes from the discharge section.</li> <li>* Change the heating element unit.</li> </ul>	
The burner "coughs"	Stop the unit	Excess gas	<ul style="list-style-type: none"> <li>* Verify the passage of air at the burner section access panel, the mesh plate and the injector.</li> <li>* Verify the burner fan is operating correctly. Measure the amps.</li> </ul>	150 and G205: 0.5 Amp G250, G350 and G400: 0.8 Amp
The burner does not start after three attempts	Stop the unit	Initial start-up	<ul style="list-style-type: none"> <li>* Check the opening of the gate valve.</li> <li>* Check which type of expansion valve is installed (the expansion valve may be fitted with a manual reset).</li> <li>* Check the gas inlet pressure.</li> </ul>	Min pressure G20 and G25: 15 mbar. Min pressure G31: 20 mbar
		Electrical problem (wiring, etc.)	<ul style="list-style-type: none"> <li>* Check the state of the module's LEDs (see table 8)</li> <li>* Check the operation of the burner fan</li> </ul>	G150 and G205: 0.5 Amp G250, G350 and G400: 0.8 Amp
		The electrode is out of operation	<ul style="list-style-type: none"> <li>* Check the power supply voltage of the electrode (110 V) at start-up. If the voltage is zero the IGN module may be out of operation: check its power supply</li> </ul>	2 power supplies to the module: 115 V (Electrode) 24 V (Gas unit solenoid valves)
		There is no gas supply	<ul style="list-style-type: none"> <li>* Start a new cycle and check in the sight glass that the electrode is incandescent. If it is not, change the electrode (*)</li> <li>* Check the pressure downstream of the gas unit. If the partial vacuum is high, the gas is not supplied. Change the gas unit.</li> </ul>	Partial vacuum: 5 mm WH +/- 4 mm.
A series of explosions inside the heating element	Stop the unit immediately	The stainless steel diffusion grille inside the heating element is damaged.	<ul style="list-style-type: none"> <li>* Dismantle the burner unit and change the grille.</li> <li>* Change the 2 seals.</li> </ul>	

(\*) If the electrode reference is 231T (Flat electrode) the resistance can be checked. It must be between 40 and 150 ohms. If it is outside this range the electrode must be replaced.

# Notes

# Safety recommendations

To avoid accidents and damage, the following recommendations should be observed during maintenance and service visits :

1. The maximum allowable pressures for system leak testing on low and high pressure side are given in the chapter "Installation". Always provide a pressure regulator.

2. Disconnect the main supply before any servicing on the unit.
3. Service work on the refrigeration system and the electrical system should be carried out only by qualified and experienced personnel.

# Maintenance contract

It is strongly recommended that you sign a maintenance contract with your local Service Agency. This contract provides regular maintenance of your intallation by a specialist in our equipment. Regular maintenance ensures that any malfunction is detected and corrected in good time and minimizes the possibility that serious damage will

occur. Finally, regular maintenance ensures the maximum operating life of your equipment. We would remind you that failure to respect these installation and maintenance instructions may result in immediate cancellation of the warranty.

# Training

The equipment described in this manual is the result of many years of research and continuous development. To assist you in obtaining the best use of it, and maintaining it in perfect operating condition over a long period of time, the constructor has at your disposal a refrigeration and air conditioning service school. The principal aim of this is to give operators and maintenance technicians a better knowledge of the equipment they are using, or that is

under their charge. Emphasis is particularly given to the importance of periodic checks on the unit operating parameters as well as on preventive maintenance, which reduces the cost of owning the unit by avoiding serious and costly breakdown.

The constructor's policy is one of continuous product improvement, and he reserves the right to alter any details of the products at any time without notice

This publication is a general guide to install, use and properly maintain our products. The information given may be different from the specification for a particular country or for a specific order. In this event, please refer to your nearest office.

For additional information, contact :



Distributor / Installer stamp

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means without the written authorization of the constructor.

T50 IM 002 E - 0199 •  
Supersedes T50 IM 002 E - 0896