



Voyager™ III Rooftop Units

Cooling-only

TKD/TKH 275-300-350-400-500-600

Heat-pump

WKD/WKH 400-500-600

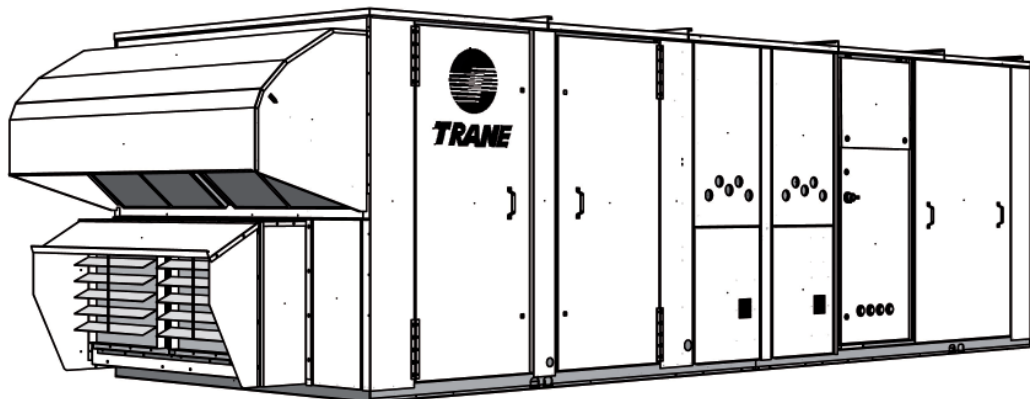
Gas-fired

YKD/YKH 275-300-350-400-500-600

Heat-pump with gas-fired heating

DKD/DKH 400-500-600

R410A Refrigerant



RT-PRC022J-E4



Table of Contents

| | |
|---------------------------------------|-----------|
| Features and Benefits | 4 |
| Options and Accessories | 9 |
| Selection Procedure | 16 |
| General Data | 17 |
| Performance Data | 21 |
| Electrical Data..... | 24 |
| Dimensions and Weights | 25 |
| Controls | 27 |
| Mechanical Specifications..... | 30 |



Features and Benefits

Standard Features

- Factory installed and tested microelectronic controls
- Scroll compressors
- Dedicated downflow or horizontal configuration
- FROSTAT™ coil frost protection on all units
- Supply airflow proving
- Emergency stop input
- Compressor lead-lag
- Occupied-unoccupied switching
- Timed override activation
- FC supply fans
- 50mm standard efficiency filters to start the system up
- Finish exceeds salt spray requirements of ASTM B117
- Sloped condensate drain pan

Scroll Compressor

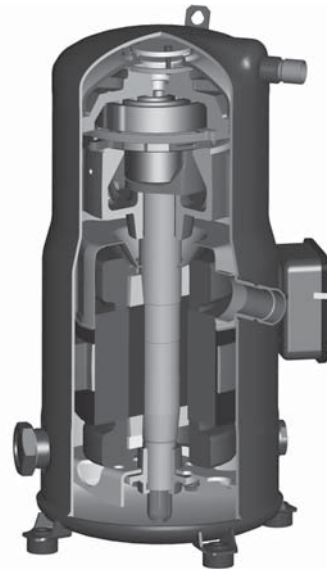
Simple Design with 70% Fewer Parts

Fewer parts than an equal capacity reciprocating compressor means significant reliability and efficiency benefits. The single orbiting scroll eliminates the need for pistons, connecting rods, wrist pins and valves. Fewer parts lead to increased reliability. Fewer moving parts, less rotating mass and less internal friction means greater efficiency than reciprocating compressors. The Scroll provides important reliability and efficiency benefits. The Scroll allows the orbiting scrolls to be in contact in all three dimensions, forming a completely enclosed compression chamber which leads to increased efficiency. In addition, the orbiting scrolls only come in contact with the minimum required force to create a seal so there is no wear between the scroll plates. The fixed and orbiting scrolls are made of high strength cast iron which results in less thermal distortion, less leakage, and higher efficiencies. The most outstanding feature of the Scroll is that the slugging will not cause failure. In contrast, the liquid or dirt found in a reciprocating compressor may cause serious damage.

Low Torque Variation

The Scroll compressor has a very smooth compression cycle with torque variations that are only 30 percent of that produced by a reciprocating compressor. This means the scroll compressor imposes very little stress on the motor for greater reliability. Low torque variation means reduced noise and vibration.

Figure 1



Suction Gas Cooled Motor

Compressor motor efficiency and reliability is further optimized with this design. Cool suction gas keeps the motor cooler for longer life and better efficiency.

Proven Design Through Testing and Research

With over twenty years of development and testing, Scroll compressors have undergone more than 400,000 hours of laboratory testing and field operation. This work combined with over 25 patents makes Trane the worldwide leader in air conditioning scroll compressor technology.

Figure 2 - One of two matched scroll plates - the distinguishing feature of the scroll compressor



Features and Benefits

Figure 3 - TD5 service and diagnostic user display



The TD-5 display allows you to view data and make operational changes on Voyager rooftop equipped with ReliaTel control v3.4 or above.

TD-5 is an 5" (127mm diagonal) high resolution color touch screen display

TD-5 provides in 26 languages:

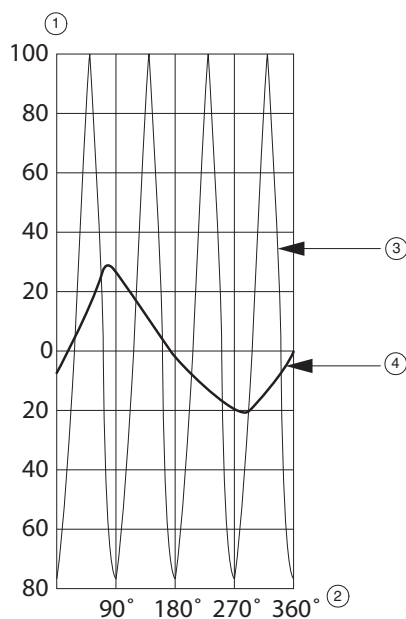
- 15 different reports (3 custom, 12 standard)

- 12 different graphs (4 custom, 8 standard)

- View and reset Historic of last 100 detailed alarms.

Graph data can be exported to an excel file through USB memory stick.

Figure 4 - Low torque variation of 3-D scroll compressors vs. reciprocating compressor



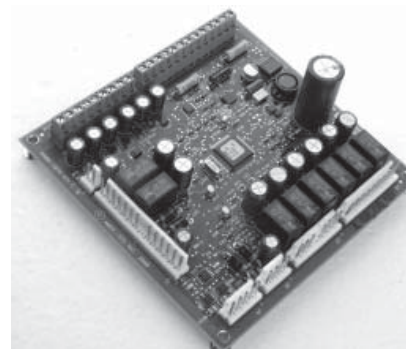
- 1 = Torque (%)
- 2 = Crank angle
- 3 = Scroll
- 4 = 4 Cylinder reciprocating

Quality and Reliability

ReliaTel Controls

- ReliaTel requires no special tools to run the Voyager unit through its paces. Simply press the Test button located on the right side of the control panel and the unit will walk through its operational steps automatically.
- As long as the unit has power and the LED is lit, ReliaTel is operational. The light indicates that ReliaTel is functioning properly.
- ReliaTel features expanded diagnostic capabilities when utilized with Trane's Integrated Comfort™ Systems.
- One Zone Sensor option has central control panel lights which indicate the mode the unit is in and possible diagnostic information (dirty filters for example).

Figure 5 - RTRM (ReliaTel™ Refrigeration Module)



- ReliaTel improves quality and reliability through the use of time-tested microprocessor controls and logic. ReliaTel:
 - prevents the unit from short cycling, considerably improving compressor life.
 - ensures that the compressor will run for a specific amount of time allowing oil to return for better lubrication, enhancing the reliability of the compressor.
- The Voyager with ReliaTel reduces the number of components required to operate the unit, thereby reducing possibilities for component failure.

The unit is equipped in standard with phase reversing protection preventing reverse rotation operation on compressors and other unit motors.

Features and Benefits

Modulating Gas Burner

- Efficiency

The modulating gas burner operates as a condensing gas burner for the main part of its operating range. This result in a drastically improved efficiency (up to 105%) and optimum energy usage.

- Comfort

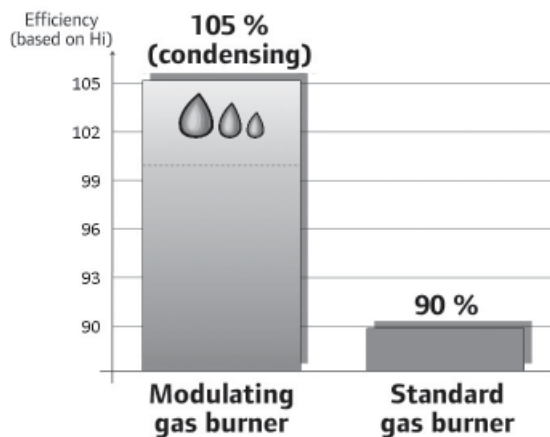
The modulating burner adapts the heating capacity to the building need. Modulation of heating capacity results in continuous operation of the burner at part load. Reduced ON-OFF cycling improves the gas consumption used during each start up of the burner as well as discharge air temperature variation.

Temperature uniformity: Control of the supply air temperature reduces air stratification effect caused by high temperature supply air. This result in a better mixing of the supply air with the air in the room.

- Reliability

Full stainless steel welded construction ensures reliable heat exchanger tightness.

Flame control: Ignition and combustion controller use a proven direct spark ignition with pre-mix burner technology. This result in a constant gas/air mix and optimized combustion quality over the complete operating map.



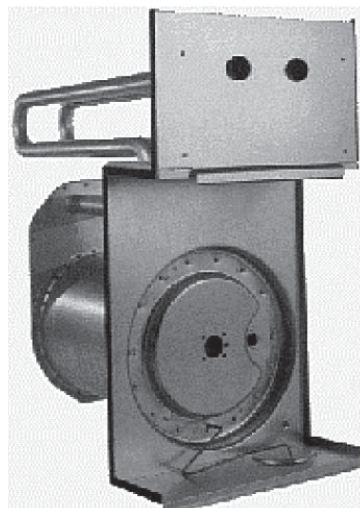
Drum and Tube Gas Heat Exchanger

- The drum and tube heat exchanger is designed for increased efficiency and reliability and has utilized improved technology incorporated in the large rooftop commercial units for almost 20 years.
- The heat exchanger is manufactured using aluminized steel with stainless steel components for maximum durability. The drum and tube design has been tested and passed over 150,000 cycles.
- The negative pressure gas valve will not allow gas flow unless the combustion blower is operating. This is one of our unique safety features.
- The forced combustion blower supplies premixed fuel through a single stainless steel burner screen into a sealed drum where ignition takes place. It is more reliable to operate and maintain than a multiple burner system.
- The ignitor is a gas ignition device which doubles as a safety device utilizing a continuous test to prove the flame. The design is cycle tested at the factory for quality and reliability.
- **The Trane Voyager Rooftop has, by far, the best COP in its class. All performances are Eurovent certified which provides the assurance of accurate performance and common comparison criteria.**

Rigorous Testing

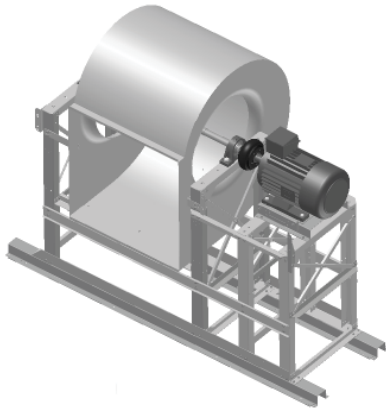
- All of Voyager's designs were rigorously rain tested at the factory to ensure water integrity.
- Rigging tests include lifting a unit into the air and letting it drop one foot, assuring that the lifting lugs and rails hold up under stress.
- We perform a 100% coil leak test at the factory. The evaporator and condenser coils are leak tested at 1.4 MPa and pressure tested to 3.1 MPa.
- All parts are inspected at the point of final assembly. Sub-standard parts are identified and rejected immediately.
- **Every unit receives a 100% unit run test before leaving the production line to make sure it lives up to rigorous Trane requirements.**

Figure 6



Features and Benefits

Figure 7 - Variable speed direct drive supply fan



Variable Speed Direct Drive Supply Fan

Efficient, flexible and low maintenance direct driven fan

High Efficiency Fan

Direct transmission, variable speed drives delivers energy saving through 3 aspects :

- Higher fan nominal efficiency: The pulley no longer penalizes the airflow stream at the an inlet, resulting in less turbulence and higher fan static efficiency.
- Direct coupling drive efficiency: The direct coupling concept avoids losses by belt friction. Classic belt drive is depletes part of the motor power caused by improper belt tension, pulley mis-alignment. The direct driven fan improves motor consumption by about 15% to 20% compared to belt driven fan.
- Reduction of power input with fan speed modulation at part load or in ventilation mode. Substantial energy savings can be achieved by reducing fan speed by only 20%, resulting in 20% less airflow and 50% less absorbed power. On a typical application, the result is an annual energy saving of 30% of the total rooftop consumption.
- Power factor of the fan motor is corrected and inrush current is very low thanks to progressive fan ramp up start (by default: 1 minute ramp up time).

Reduced maintenance costs with:

- Almost no maintenance direct coupling compared to belt drive.
- Easy commissioning with adjustment of nominal airflow and ramp up time for progressive textile duct inflation.

Ease of Installation

Voyager units provide many time and money saving features.

Conversionless Units

The dedicated design units (either downflow or horizontal) require no panel removal or alteration time to convert in the field - a major cost saving during installation.

Improved Airflow

U-shaped airflow allows for improved static capabilities. The need for high static motor conversion is minimized and time is not spent changing to high static oversized motors.

Single Point Power

A single electrical connection powers the unit.

Single Side Access

Service technicians can access all major components from one side, opening the easy access panels.

Standardized Components

- Components are placed in the same location for all Voyager units.
- One single Unit controller (Reliatel™) can fit all Voyager models. This provides standardization of parts.

Serviceability

Voyager was designed with input from service contractors. Their information helped us design a unit that would get the service technician off the job quicker and save the owner money.

Voyager's Simpler Design

The Voyager design uses fewer parts than previous units. Since it is simpler in design, it is easier to diagnose.

Micro

- The Micro requires no special tools to run the Voyager unit through its paces. Simply press the Test button located on the right side of the control panel and the unit will walk through its operational steps automatically.
- As long as the unit has power and the LED is lit, the Micro is operational. The light indicates that the Micro is functioning properly.
- The Micro features expanded diagnostic capabilities when utilized with Trane's Integrated Comfort™ Systems.
- One Zone Sensor option has central control panel lights which indicate the mode the unit is in and possible diagnostic information (dirty filters for example).



Features and Benefits

Easy Access Low Voltage Terminal Board

Voyager's Low Voltage Terminal Board is external to the electrical control cabinet. It is extremely easy to locate and attach the thermostat wire. This is another cost and time saving installation feature.

Indoor Air Quality

- Filters. All rooftops are shipped with throw-away filters as a standard to be used during the first days of operation (usually the jobsite is not completely clean, and high efficiency filters would get dirty in a couple of hours, this would be a waste of money). We propose optional EU4 permanent filters for regular operation.
- Panels in the indoor air section have a fire-resistant (M0) aluminum foil-faced insulation. There is no more insulation particles carried over by the air. It can be cleaned which is particularly interesting for restaurant applications.
- All our drain pans are sloped. We thus avoid water stagnation that generates corrosion and micro-organism life such as mold and fungi.

Reliabel Unit Controller Benefits

- Reliabel in the Voyager units has built-in anti-short-cycle timer, time delay relay and minimum "on" time controls. These controls are functions of Reliabel and are factory tested to assure proper operation.
- Reliabel softens electrical "spikes" by staging on fans, compressors and heaters.
- The Intelligent Fallback or Adaptive Control is a benefit to the building occupant. If a component goes astray, the unit will continue to operate at predetermined temperature set point.
- Intelligent Anticipation is a standard feature of Reliabel. It functions constantly as Reliabel and zone sensor work together in harmony to provide tighter comfort control than conventional electromechanical thermostats.

On dual fuel units (DKD/DKH), Reliabel automatically selects the best source of heat. In low ambient operation, when mechanical heating is not delivering enough performance, the compressor switches off and the gas burner delivers heat in optimized conditions. This result in an optimized energy consumption and higher compressor life cycle.

Options and Accessories

In order to best suit customers requirements, Trane commercial Voyager can be fitted with a lot of options and accessories. The following table demonstrates these capabilities.

Table 1 - Options and Accessories - Voyager III

| | TKD | TKH | WKD | WKH | YKD | YKH | DKD | DKH | Application | Description | Incompatible with |
|---|-----|-----|-----|-----|-----|-----|-----|-----|--|--|--|
| FRESH AIR OPTIONS | | | | | | | | | | | |
| 0-25% manual fresh air hood | O | O | O | O | O | O | O | O | Fresh air needed in the building, up to 25% of the nominal airflow. | Manually sets a permanent amount of fresh air in the unit, between 0-25% of the nominal airflow. | Economizer, CO2 sensor, remote potentiometer, barometric relief, power exhaust fans. |
| Economizer comparative enthalpy control | O | O | O | O | O | O | O | O | Fresh air needed in the building, up to 50% of nominal airflow, and intelligent energy saving. | The economizer is composed of 2 sets of temperature and humidity sensors that measure ambient and room enthalpy, and of a fresh air damper connected to a return air damper. The free-cooling function modulates between the permanent set value (between 0-50%) and 100% of the nominal airflow using the fresh air enthalpy to cool down the building. It also has a permanent fresh air function. | 0-25% manual hood. |
| Energy Recovery Module | O | O | O | O | O | O | O | O | When unit has to operate with a fresh air rate higher than 15% in extreme outdoor temperature (winter and summer). It is important to recover heat from exhaust air and transfer it to the fresh air. Result is a reduction of the installed heating/cooling capacity. | A energy recovery module is installed on the fresh air side of the unit. 2 technologies for 2 levels of efficiency (Plate heat exchanger efficiency 50-60%, Heat recovery wheel efficiency 60-85%) Free cooling function is integrated (100% fresh air with by-passed exchanger). Heat recovery wheel has an hygroscopic treatment allowing partial transfer of moisture in parallel to sensible heat. | 0-25% manual hood. |
| Remote potentiometer | A | A | A | A | A | A | A | A | To remotely set the permanent fresh air intake. | Connected to the potentiometer of the economizer, can modify remotely the permanent fresh air amount brought into the unit between 0-50% of the nominal airflow. | 0-25% manual fresh air hood, not recommended with CO ₂ sensor. |
| CO ₂ sensor | O | O | O | O | O | O | O | O | Hygienic control of the air. | Works with the economizer and brings fresh air (modulating between the permanent fresh air setpoint and 50% of the nominal airflow) whenever the CO2 concentration in the room meets or exceeds the adjustable threshold. The sensor itself has to be mounted in a relevant place in the room or in the ductwork. | 0-25% manual hood, not recommended with remote potentiometer. |
| Barometric relief | O | O | O | O | O | O | O | O | To minimize overpressure in the building when fresh air intake is around 25% and pressure drop in the return duct is very low. | Damper placed in the return section opens with the overpressurization of the return air. 25% of this return air is blown outside. | 0-25% manual hood, exhaust fans. |
| Exhaust fans | O | O | O | O | O | O | O | O | To minimize overpressure in the building caused by the introduction of fresh air, when the economizer fresh air damper set at 40-50% OA (permanent value), and/or when the pressure drop in the return duct is between the building overpressure accepted by the customer (12-25 Pa) and 200 Pa (maximum fan static pressure). | When the exhaust fans are off, the gravity dampers open with increased building pressure to relieve the air pressure. When the exhaust fans are on, around 50% of airflow can be exhausted, depending on the pressure drop of the return. They turn on whenever the position of the economizer fresh air dampers meet or exceed the power exhaust setpoint (when the supply fan is on). | 0-25% manual fresh air hood, barometric relief option (because it is already included in the "exhaust fans" option). |

Legend

- A = Accessory (to be mounted on site).
 - O = Option (factory mounted and tested).
 - S = Standard feature mounted on all units.
- Other options or configurations are available. Please contact your local sales office for more information.

Options and Accessories

Table 1 - Options and Accessories - Voyager III (cont.)

| | TKD | TKH | WKD | WKH | YKD | YKH | DKD | DKH | Application | Description | Incompatible with |
|---|-----|-----|-----|-----|-----|-----|-----|-----|--|---|------------------------------------|
| HEATING DEVICES | | | | | | | | | | | |
| Hot water coil | O | O | O | O | - | - | - | - | Need of heating or additional heating on cooling only units or heat pump units. Hot water loop available on site. | Avoids the power consumption of an electric heater by using the hot water loop available to heat the building. | Electric heaters, gas fired units. |
| Modulating Gas burner | - | - | O | O | - | - | O | O | Need more efficient gas burner (Condensing at part load) Low mixed air temperature (<5°C). Need discharge temperature control. | Modulating heat output adapted to the building need and discharge temperature. Condensation of flue gases allow efficiency to rise up to 105%. | Electric heaters, Hot water coil |
| Electric heaters | O | O | O | O | - | - | - | - | Need of heating or additional heating on cooling only units or heat pump units. Very useful with a heat pump unit to keep a good comfort level during the defrost cycle. | On a heat pump unit, in heating mode, turns on when the compressors job does not raise the temperature fast enough. On a heat pump, in heating mode, during the outdoor coil defrost cycle, the electric heater turns on to avoid blowing cold air in the building. | Hot water coil, gas fired units. |
| VENTILATION | | | | | | | | | | | |
| EU4 filters 50 mm & 100 mm | O | O | O | O | O | O | O | O | To filter the air (with less pressure drop for 100mm filters). | Washable media, treat the return and fresh air, 90% gravimetric efficiency. | |
| EU4+EU7 filters | O | O | O | O | O | O | O | O | To filter the air. | 50mm+50mm Galvanized steel frame filters. Washable media for EU4 pre-filter, EU7 provides 85% opacimetric efficiency. | |
| Clogged filter detector | O | O | O | O | O | O | O | O | To facilitate maintenance of the filters. | When the pressure drop of the filter exceeds the selectable value, this differential pressostat report an alarm via a dry contact to the micro-control. | |
| "80%-100% inverter on indoor fan (Belt driven)" | O | O | O | O | O | O | O | O | Used to reduce fan speed and provide energy savings. | Speed inverter controls fan speed automatically down to 80% during part load, free-cooling and ventilation only mode. | |
| "80%-100% inverter on indoor fan (Direct driven)" | O | O | O | O | O | O | O | O | Combine energy savings of fan speed reduction and reduced transmission loss of the direct coupling. | Speed inverter controls fan speed automatically down to 80% during part load, free-cooling and ventilation only mode. Additional saving of direct coupling that improve motor absorbed power by 10 to 15% compared to belt driven fan. | |
| Soft starter | O | O | O | O | O | O | O | O | To achieve a progressive supply fan start. | Soft starter option achieved by the inverter. Starting time can be adjusted from 0 to 3800 seconds (factory-set at 60s). | |
| "80%-100% inverter on indoor fan + soft starter" | O | O | O | O | O | O | O | O | The soft fan start is included in the inverter 80-100% program. | Fan speed automatically drops to 80% during part load, free-cooling mode and in ventilation only. Soft starter option achieved by the inverter. | |

Legend

A = Accessory (to be mounted on site).
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S = Standard feature mounted on all units.
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Options and Accessories

Table 1 - Options and Accessories - Voyager III (cont.)

| | TKD | TKH | WKD | WKH | YKD | YKH | DKD | DKH | Application | Description | Incompatible with |
|--|-----|-----|-----|-----|-----|-----|-----|-----|---|---|----------------------|
| SAFETY | | | | | | | | | | | |
| Fire thermostat | A | A | A | A | A | A | A | A | To stop the unit when temperature of the air stream rises abnormally. | A kit of 2 manual reset thermostats are delivered. The first one, to be placed in the return duct, stops the unit and put the unit in general fault when the airstream rises above 57°C, the second, to be placed in the supply duct, reacts above 115°C. Temperature threshold cannot be changed. | |
| Smoke detector | O | O | O | O | O | O | O | O | To detect smoke in the building. | Closes the return air damper if an economizer is installed, stops the indoor fan, switches off the electric heater if installed and energized, and put the unit in general fault. This option provides a post ventilation period of 30 seconds in the case of high temperature cut out. | |
| High temperature safety thermostat | - | - | - | - | O | O | O | O | For the French ERP regulation only: additional security thermostat for gas-fired units. | This manual reset thermostat switches off the burner and the supply fan, and put the unit in general fault if the supply temperature rises above 120°C. | |
| Fan failure switch | O | O | O | O | O | O | O | O | To improve security and reliability of the unit (when the indoor fan belt breaks down for instance). | Detects the lack of fan static pressure. If the indoor fan fails, then the unit operation is shut down and the "Service" light LED on the Zone Sensor starts flashing. If no air flow going through the unit is detected within 40 seconds (by differential pressure), the control will shut off all mechanical operations, lock the system, send a diagnostic to the ICS, and the "Service" LED will flash. The system will remain locked until a reset is initiated either manually or through the ICS. The option board is required. | |
| Indoor fan belt guard | O | O | O | O | O | O | O | O | Used to improve safety when accessing the unit, during maintenance and to comply with some local regulations. | Two grids placed around the indoor fan belt drive prevent people from letting their hands or fingers get in contact with the moving parts and therefore reduce the risk of injury. | |
| Three-Phase Monitoring Relay Phase reversal + Phase loss | S | S | S | S | S | S | S | S | This device monitors three-phase power supply in order to protect unit motors. It prevent risk of starting unit in reverse rotation and phase loss that could cause motor burn out. | The relay disables the unit control when one of the following failures occurs on power supply: phase reversal, phase loss. No fault reporting is not delayed. | |
| Three-Phase Monitoring Relay Phase reversal + Phase loss + Phase imbalance | O | O | O | O | O | O | O | O | This device monitors three-phase power supply in order to protect unit motors. This option is recommended when there are risks of power supply imbalance or when power factor correction capacitors are used. | The relay disables the unit control when one of the following failures occurs on power supply: phase reversal, phase loss, phase imbalance (adjustable setting). The recommended setting is as follows: 5% imbalance on 3-phase voltage. Duration of imbalance should be set at 5 seconds. | |
| ROOFCURBS | | | | | | | | | | | |
| Standard roofcurb | A | - | A | - | A | - | A | - | Connection between a flat roof and the rooftop. | Supports the rooftop and ensures watertightness roof/roofcurb/rooftop, and easy connection of the ductwork. | Adjustable roofcurb. |
| Adjustable roofcurb | A | - | A | - | A | - | A | - | Connection between a sloped roof and the rooftop. | Supports the rooftop and ensures water tightness roof/roofcurb/rooftop, and easy connection of the ductwork, correcting slope up to 5%. | Standard roofcurb. |

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Options and Accessories

Table 1 - Options and Accessories - Voyager III (cont.)

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|--|-----|-----|-----|-----|-----|-----|-----|-----|---|--|--|
| CONTROL | | | | | | | | | | | |
| ReliaTel™ Options Module (RTOM) | S | S | S | S | S | S | S | S | Required for some optional ReliaTel™ devices (froststat, clogged filter switch, fan failure switch, discharge air sensor (DAS) used for supply air tempering and ICS input data, smoke detector, external on/off switch). | Communication interface between the ReliaTel™ Refrigeration Module (RTRM) and some options. | |
| TCI-R | O | O | O | O | O | O | O | O | To communicate with Trane Integrated Comfort Systems, such as the Tracer Summit™, the Tracker™ or a Varitrac™ system (CCP2). | Communication interface between a Trane ICS device and a Voyager™. | THS/P 03, and other communication interfaces |
| LCI-R | O | O | O | O | O | O | O | O | To communicate on a LonTalk® network at the unit level. | Communication interface between a LonTalk® management system and a Voyager™. | THS/P 03, and other communication interfaces |
| BCI-R | O | O | O | O | O | O | O | O | To communicate on a BACnet® MS/TP network at the unit level. | Communication interface between a BACnet management system and a Voyager™. | THS/P 03, and other communication interfaces |
| PIC | O | O | O | O | O | O | O | O | To communicate on a Modbus network at the unit level. | Communication interface between Modbus management system and a Voyager™. | THS/P 03, and other communication interfaces |
| THS03 | A | A | A | A | A | A | A | A | Control of 1 cooling-only, heat pump or gas-fired rooftop. | Electronic thermostat, 2 stages cooling, 1 stage compressor heating, 2 stages auxiliary heating. No CTI card needed, communicates in the same language as the rooftop micro-control and uses 100% of its advanced control features | All communication interfaces |
| THP03 | A | A | A | A | A | A | A | A | Control of 1 cooling-only, heat pump or gas-fired rooftop. | Electronic programmable thermostat, 2 stages cooling, 1 stage compressor heating, 2 stages auxiliary heating, LCD screen. Communicates in the same language as the rooftop micro-control and uses 100% of its advanced control features. | All communication interfaces |
| Remote sensor box for THS/THP03 | A | A | A | A | A | A | A | A | Need of remote or additional sensors with THS/THP03 | Senses the temperature and sends the information to the THS/P 03. | THS/P 01 |
| Discharge air sensing ("Supply air tempering") | O | O | O | O | O | O | O | O | Supply air tempering maintains the supply air temperature above a lower limit during minimum ventilation periods in heating mode. Also used to monitor true discharge air temperature out of the unit. | A sensor is placed in the return air duct. | Hot water coil |
| Remote fault relay | O | O | O | O | O | O | O | O | To send alarms signals to a local BMS. | Report cool fail, Heat fail & system fail into one dry contact (Normally closed and normally open). | |
| TD-5 | A | A | A | A | A | A | A | A | Plug and play diagnostic touch screen display. Read Only device connected to ReliaTel boards. | 5 inch touch screen display. Monitor all unit parameters, input, output, graph and record parameter trend. Provide alarm historic reporting and possibility to reset alarms | |

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Options and Accessories

Table 1 - Options and Accessories - Voyager III (cont.)

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|--|-----|-----|-----|-----|-----|-----|-----|-----|--|--|------------------------|
| MISCELLANEOUS | | | | | | | | | | | |
| Black epoxy coating on condenser | O | O | O | O | O | O | O | O | Sea side application. | The black epoxy coating slows down the corrosion process on the aluminum fins. | |
| Black epoxy coating on condenser and evaporator | O | O | O | O | O | O | O | O | Sea side application when a fresh air device is used. | The black epoxy coating slows down the corrosion process on the aluminum fins. | |
| Phase out | | | | | | | | | | | |
| THP01 | A | A | - | - | A | A | A | A | Control of 1 cooling-only /gas-fired rooftop. | Electronic programmable thermostat, 2 stages cooling, 2 stages auxiliary heating, LCD screen. | TCI-R, LCI-R |
| THS01 | A | A | - | - | A | A | A | A | Control of 1 cooling-only /gas-fired rooftop. | Electronic thermostat, 2 stages cooling, 2 stages auxiliary heating, LCD screen. | TCI-R, LCI-R |
| Remote sensor box for THS/ THP01-02 | - | - | A | A | - | - | - | - | Need for remote or additional sensors with THS/P 01-02. | Senses the temperature and sends the information to the THS/P 01-02. | THS/P 03, TCI-R, LCI-R |
| Ventilated roofcurb extension (French ERP regulations) | A | A | A | A | A | A | A | A | Connection between a roofcurb and a rooftop unit installed on a roof. Used to comply to the French ERP (Etablissement Recevant du Public: Buildings open to the public) regulations. | Avoids contact between the rooftop and the roof. Openings on the sides allow natural ventilation. Protection of the building in case of failure of the rooftop causing overheating/fire. | |

Legend

A = Accessory (to be mounted on site).
 O = Option (factory mounted and tested).
 S = Standard feature mounted on all units.
 Other options or configurations are available. Please contact your local sales office for more information.

Exhaust Air Options

When is it necessary to provide building exhaust?

Whenever an outdoor air economizer is used, a building generally requires an exhaust system. The purpose of the exhaust system is to exhaust the proper amount of air to prevent over or under-pressurization of the building.

A building may have all or part of its exhaust system in the rooftop unit. Often, a building provides exhaust external to the air conditioning equipment. This external exhaust must be considered when selecting the rooftop exhaust system.

Voyager™ Commercial rooftop units offer two types of exhaust systems:

- 1 Power exhaust fan
- 2 Barometric relief dampers

Options and Accessories

Application Recommendations

Power Exhaust Fan

The exhaust fan option is a dual, non-modulating exhaust fan with approximately half the air-moving capabilities of the supply fan system.

The experience of The Trane Company is that a non-modulating exhaust fan selected for 40 to 50 percent of nominal supply airflow can be applied successfully.

The power exhaust fan generally should not be selected for more than 40 to 50 percent of design supply airflow. Since it is an on/off non-modulating fan, it does not vary exhaust airflow with the amount of outside air entering the building. Therefore, if selected for more than 40 to 50 percent of supply airflow, the building may become under-pressurized when economizer operation is allowing lesser amounts of outdoor air into the building. If, however, building pressure is not of a critical nature, the non-modulating exhaust fan may be sized for more than 50 percent of design supply airflow.

Figure 8

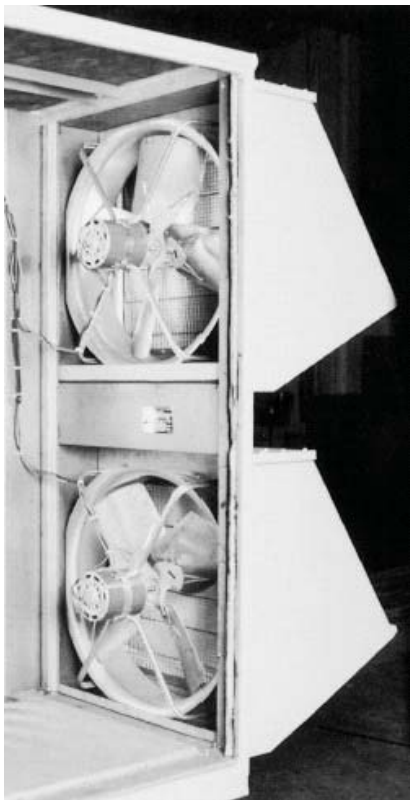
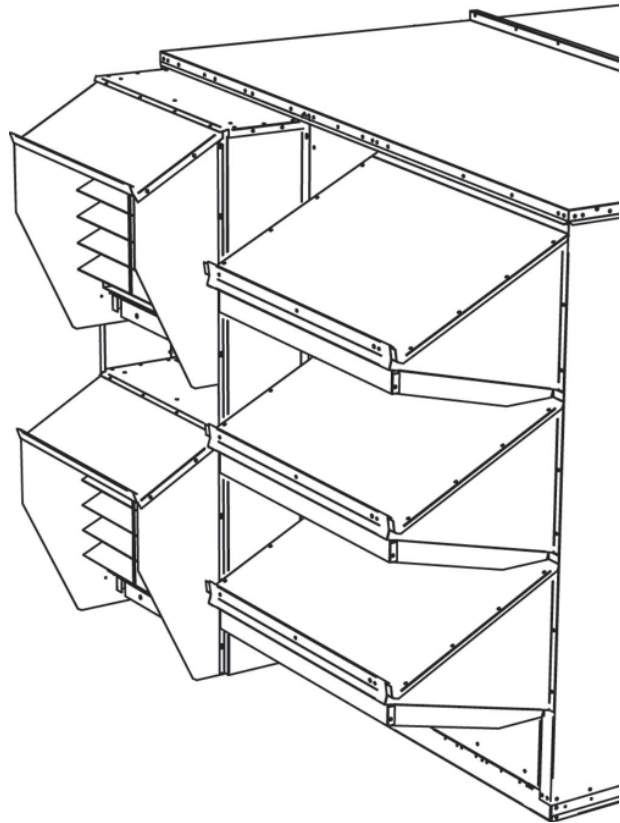


Figure 9



Barometric Relief Dampers

Barometric relief dampers consist of gravity dampers which open with increased building pressure. As the building pressure increases, the pressure in the unit return section also increases, opening the dampers and relieving air. Barometric relief may be used to provide relief for single story buildings with no return ductwork and exhaust requirements less than 25 percent.

Acoustical Considerations

Proper placement of rooftops is critical to reduce transmitted sound levels to the building. The ideal time to make provisions to reduce sound transmissions is during the design phase. And the most economical means of avoiding an acoustical problem is to place the rooftop(s) away from acoustically critical areas. If possible, rooftops should not be located directly above areas such as: offices, conference rooms, executive office areas and classrooms. Instead, ideal locations might be over corridors, utility rooms, toilets or other areas where higher sound levels directly below the unit(s) are acceptable.

Options and Accessories

Several basic guidelines for unit placement should be followed to minimize sound transmission through the building structure:

- 1) Never cantilever the compressor end of the unit. A structural cross member must support this end of the unit.
- 2) Locate the unit's center of gravity close to or over column or main support beam.
- 3) If the roof structure is very light, roof joists must be replaced by a structural shape in the critical areas described above.
- 4) If several units are to be placed on one span, they should be staggered to reduce deflection over that span.

It is impossible to totally quantify the effect of building structure on sound transmission because this depends on the response of the roof and building members to the sound and vibration of the unit components. However, the guidelines listed above are experience-proven guidelines which will help reduce sound transmissions.

Energy Recovery Module (ERM)

In order to recover heat from exhasut air, it is recomended to use the energy recovery module. It is placed on the fresh air side of the unit.

In order to satisfy two levels of efficiency, two technologies are available:

- Plate heat exchanger version with an efficiency of 50 to 60%,
- Heat recovery wheel with an efficiency of 60-85%.

The option is available in the two airflow configurations: horizontal flow and downflow

The free cooling function is still valid with this option.

The heat recovery wheel version has an hygroscopic treatment allowing partial transfer of moisture in parralel to sensible heat.

Clearance Requirements

The recommended clearances identified with unit dimensions should be maintained to assure adequate serviceability, maximum capacity and peak operating efficiency. Refer to the Minimum recommended clearances Table in this manual. A reduction in unit clearance could result in condenser coil starvation or warm condenser air recirculation. If the clearances shown are not possible on a particular job, consider the following:

- Do the clearances available allow for major service work such as changing compressors or coils?
- Do the clearances available allow for proper outside air intake, exhaust air removal and condenser airflow?
- If screening around the unit is being used, is there a possibility of air recirculation from the exhaust to the outside air intake or from condenser exhaust to condenser intake?

Actual clearances which appear inadequate should be reviewed with a local Trane sales engineer.

When two or more units are to be placed side by side, the distance between the units should be increased to 150 percent of the recommended single unit clearance. The units should also be staggered as shown for two reasons:

- 1) To reduce span deflection if more than one unit is placed on a single span. Reducing deflection discourages sound transmission.
- 2) To assure proper diffusion of exhaust air before contact with the outside air intake of adjacent unit.

Duct Design

It is important to note that the rated capacities of the rooftop can be met only if the rooftop is properly installed in the field. A well designed duct system is essential in meeting these capacities.

The satisfactory distribution of air throughout the system requires that there be an unrestricted and uniform airflow from the rooftop discharge duct. This discharge section should be straight for at least several duct diameters to allow the conversion of fan energy from velocity pressure to static pressure.

However, when job conditions dictate elbows be installed near the rooftop outlet, the loss of capacity and static pressure may be reduced through the use of guide vanes and proper direction of the bend in the elbow. The high velocity side of the rooftop outlet should be directed at the outside radius of the elbow rather than the inside.

General Data

Table 2 - General Data

| Cooling only/Gas fired unit | | TKD/TKH YKD/YKH | TKD/TKH YKD/YKH | TKD/TKH YKD/YKH | TKD/TKH YKD/YKH | TKD/TKH YKD/YKH | TKD/TKH YKD/YKH |
|---------------------------------------|---------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | | 275 | 300 | 350 | 400 | 500 | 600 |
| Eurovent Performances (1) | | R410A | R410A | R410A | R410A | R410A | R410A |
| Net Cooling Capacity | (kW) | 82.8 | 88.2 | 93.1 | 120.3 | 131.9 | 153.5 |
| Total Power input in cooling | (kW) | 24.9 | 27.3 | 29.6 | 39.8 | 46.9 | 58.6 |
| EER | | 3.33 | 3.23 | 3.14 | 3.02 | 2.81 | 2.62 |
| Eurovent Efficiency class Cooling | | A | A | A | A | B | C |
| Main Power supply | V/Ph/Hz | 400/3/50 | 400/3/50 | 400/3/50 | 400/3/50 | 400/3/50 | 400/3/50 |
| Outdoor sound power level env. | (dBA) | 88 | 88 | 89 | 90 | 90 | 91 |
| Indoor sound power level in duct | (dBA) | 84 | 84 | 85 | 87 | 87 | 88 |
| Outdoor sound pressure level env. (6) | (dBA) | 56 | 56 | 57 | 57 | 58 | 58 |
| Unit amps | | | | | | | |
| Unit max amps (3) | (A) | 76 | 78 | 87 | 108 | 149 | 177 |
| Unit start up amps (3) | (A) | 209 | 209 | 209 | 209 | 209 | 209 |
| Unit power factor (1) | | 0.78 | 0.79 | 0.78 | 0.77 | 0.81 | 0.79 |
| Short circuit current | (kA) | 10 | 10 | 10 | 10 | 10 | 10 |
| Electric Heater | | | | | | | |
| Heating Capacity | (kW) | 25 | 37.5 | 50 | 62.5 | 75 | 75 |
| Capacity steps | (kW) | 12.5/12.5 | 25/12.5 | 25/25 | 25/37.5 | 37.5/37.5 | 37.5/37.5 |
| Rated Amps | (A) | 36.1 | 54.1 | 72.2 | 90.2 | 108.3 | 108.3 |
| Gas burner (YKD/YKH) | | | | | | | |
| Staged Low heat version | | | | | | | |
| Heating Input (G20) | (kW) | 77 | 77 | 77 | 85 | 85 | 85 |
| Heating Output (G20) | (kW) | 69.3 | 69.3 | 69.3 | 77.4 | 77.4 | 77.4 |
| Steady State Efficiency | (%) | 90 | 90 | 90 | 91 | 91 | 91 |
| No. Burners | # | 1 | 1 | 1 | 1 | 1 | 1 |
| No. Stages | # | 2 | 2 | 2 | 2 | 2 | 2 |
| Gas Connection Pipe Size | | 3/4" NPT | 3/4" NPT | 3/4" NPT | 3/4" NPT | 3/4" NPT | 3/4" NPT |
| Staged High heat version | | | | | | | |
| Heating Input (G20) | (kW) | 130 | 130 | 130 | 170 | 170 | 170 |
| Heating Output (G20) | (kW) | 117.5 | 117.5 | 117.5 | 154.8 | 154.8 | 154.8 |
| Steady State Efficiency | (%) | 90 | 90 | 90 | 91 | 91 | 91 |
| No. Burners | # | 2 | 2 | 2 | 2 | 2 | 2 |
| No. Stages | # | 2 | 2 | 2 | 2 | 2 | 2 |
| Gas Connection Pipe Size | | 1" NPT | 1" NPT | 1" NPT | 1" NPT | 1" NPT | 1" NPT |
| Modulating gas heat version | | | | | | | |
| Heating Input Min Max (G20) | (kW) | 44/155 | 44/155 | 44/155 | 44/155 | 44/155 | 44/155 |
| Heating Output Min/Max (G20) | (kW) | 46.3/145 | 46.3/145 | 46.3/145 | 46.3/145 | 46.3/145 | 46.3/145 |
| Steady State Efficiency | (%) | 105% - 93.5% | 105% - 93.5% | 105% - 93.5% | 105% - 93.5% | 105% - 93.5% | 105% - 93.5% |
| No. Burners | # | 1 | 1 | 1 | 1 | 1 | 1 |
| Modulation | % | 32%-100% | 32%-100% | 32%-100% | 32%-100% | 32%-100% | 32%-100% |
| Gas Connection Pipe Size | | 1" ISO R7 | 1" ISO R7 | 1" ISO R7 | 1" ISO R7 | 1" ISO R7 | 1" ISO R7 |
| Condensate outlet Pipe Size | mm | 18 | 18 | 18 | 18 | 18 | 18 |
| Compressor | | | | | | | |
| Number | # | 2 | 2 | 2 | 2 | 2 | 2 |
| Type | | Scroll | Scroll | Scroll | Scroll | Scroll | Scroll |
| Model | | 13T/13T | 13T/15T | 15T/15T | 15T/25T | 15T/30T | 25T/30T |
| Rated Amps (2) | (A) | 25.1/25.1 | 25.1/30.5 | 30.5/30.5 | 30.5/51.2 | 30.5/58.0 | 51.2/58.0 |
| Locked rotor Amps (2) | (A) | 158/158 | 158/197 | 197/197 | 197/260 | 197/320 | 260/320 |
| Outdoor Coil | | | | | | | |
| Type | | Wavy | Wavy | Wavy | Wavy | Wavy | Wavy |
| Tube Size OD | (mm) | 9.52 | 9.52 | 9.52 | 9.52 | 9.52 | 9.52 |
| Face Area | (m ²) | 4.8 | 4.8 | 4.8 | 6.1 | 6.1 | 6.1 |
| Rows/Fin series | #/FPF | 2/192 | 2/192 | 2/192 | 2/192 | 2/192 | 3/192 |
| Indoor Coil | | | | | | | |
| Type | | Wavy | Wavy | Wavy | Wavy | Wavy | Wavy |
| Tube Size OD | (mm) | 9.52 | 9.52 | 9.52 | 9.52 | 9.52 | 9.52 |
| Face Area | (m ²) | 2.9 | 2.9 | 2.9 | 3.4 | 3.4 | 3.4 |
| Rows/Fin series | #/FPF | 3/180 | 3/180 | 3/180 | 4/180 | 4/180 | 4/180 |
| Refrigerant Control | | TXV | TXV | TXV | TXV | TXV | TXV |
| Drain Connection No./Size | (mm) | 1/32mm | 1/32mm | 1/32mm | 1/32mm | 1/32mm | 1/32mm |
| Outdoor Fan | | | | | | | |
| Nominal Airflow | (m ³ /h) | 41100 | 41100 | 41100 | 48700 | 48700 | 43600 |
| Type | | Axial | Axial | Axial | Axial | Axial | Axial |
| Diameter | (mm) | 710 | 710 | 710 | 710 | 710 | 710 |
| Drive type | | Direct | Direct | Direct | Direct | Direct | Direct |
| Number/Voltage | #/V | 3/400V | 3/400V | 3/400V | 4/400V | 4/400V | 4/400V |
| Motor HP | (kW) | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 |
| Motor Rated Amps (2) | (A) | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 |
| Motor RPM | (rpm) | 915 | 915 | 915 | 915 | 915 | 915 |



General Data

Table 2 - General Data (Cont.)

| Indoor Fan | | | | | | | |
|---|----------|------------------|------------------|------------------|------------------|------------------|------------------|
| Minimum Airflow | (m3/h) | 10880 | 12240 | 13600 | 16320 | 19680 | 23600 |
| Nominal Airflow | (m3/h) | 13600 | 15300 | 17000 | 20400 | 24600 | 29500 |
| Maximum Airflow | (m3/h) | 16320 | 18360 | 20400 | 24480 | 29520 | 35400 |
| Maximum static pressure available (4) | (Pa) | 525 | 520 | 465 | 590 | 600 | 600 |
| Type | | FC Centrifugal | FC Centrifugal | FC Centrifugal | FC Centrifugal | FC Centrifugal | FC Centrifugal |
| Number | # | 1 | 1 | 1 | 1 | 1 | 1 |
| Diameter/Width | (in/in) | 22.4"/22" | 22.4"/22" | 22.4"/22" | 25"/25" | 25"/25" | 25"/25" |
| Belt driven fan version | | | | | | | |
| Motor HP (Standard/Oversized) | (kW) | 5.5/7.5 | 5.5/7.5 | 7.5/11 | 7.5/11 | 7.5/15 | 11/15 |
| Motor Rated Amps (Standard/Oversized) | (A) | 11.9/15.2 | 11.9/15.2 | 15.2/21.1 | 15.2/21.1 | 15.2/29.1 | 21.1/29.1 |
| Motor Locked rotor Amps (Standard/Oversized) | (A) | 70/106 | 70/106 | 106/162 | 106/162 | 106/216 | 162/216 |
| Motor RPM (Standard/Oversized) | (rpm) | 1450/1450 | 1450/1450 | 1450/1450 | 1450/1450 | 1450/1450 | 1450/1450 |
| Direct driven fan version | | | | | | | |
| Motor HP (Standard/Oversized) | (kW) | 5.5/7.5 | 5.5/7.5 | 5.5/7.5 | 11/15 | 11/15 | 11/15 |
| Motor Max Amps(Standard/Oversized) | (A) | 10.3/13.9 | 10.3/13.9 | 10.3/13.9 | 18.2/25.6 | 18.2/25.6 | 18.2/25.6 |
| Motor RPM (Standard/Oversized) | (rpm) | 963/970 | 963/970 | 963/970 | 970/973 | 970/973 | 970/973 |
| Energy Recovery Module (5) | | | | | | | |
| Plate Heat exchanger version | | | | | | | |
| Heat recovery efficiency at 10%/50% fresh air | (%) | 62%/59% | 61%/58% | 61%/58% | 61%/58% | 61%/58% | 61%/57% |
| Air pressure drop at 10%/50% fresh air | (Pa) | 3Pa/56Pa | 4Pa/69Pa | 5Pa/83Pa | 2Pa/38Pa | 3Pa/54Pa | 4Pa/75Pa |
| Exhaust fan kW at 10%/50% fresh air | (kW) | 0.3kW/0.4kW | 0.3kW/0.6kW | 0.3kW/0.6kW | 0.5kW/0.7kW | 0.5kW/1kW | 0.5kW/1.4kW |
| Length (Downflow/Horizontal flow) | (mm) | 2288/2440 | 2288/2440 | 2288/2440 | 3050/3335 | 3050/3335 | 3050/3335 |
| Width (Downflow/Horizontal flow) | (mm) | 2295/2143 | 2295/2143 | 2295/2143 | 2295/2295 | 2295/2295 | 2295/2295 |
| Height (Downflow/Horizontal flow) | (mm) | 1858/1808 | 1858/1808 | 1858/1808 | 2010/1960 | 2010/1960 | 2010/1960 |
| Weight (Downflow/Horizontal flow) | (kg) | 799/807 | 799/807 | 799/807 | 1155/1240 | 1155/1240 | 1155/1240 |
| Rotary Wheel Heat exchanger version | | | | | | | |
| Heat recovery efficiency at 10%/50% fresh air | (%) | 84%/69% | 83%/66% | 83%/64% | 85%/71% | 84%/68% | 83%/64% |
| Air pressure drop at 10%/50% fresh air | (Pa) | 10Pa/72Pa | 12Pa/83Pa | 13Pa/95Pa | 13Pa/91Pa | 16Pa/114Pa | 20Pa/143Pa |
| Exhaust fan kW at 10%/50% fresh air | (kW) | 0.4kW/0.5kW | 0.4kW/0.7kW | 0.4kW/0.7kW | 0.5kW/0.8kW | 0.5kW/1kW | 0.5kW/1.4kW |
| Length (Downflow/Horizontal flow) | (mm) | 2440/2440 | 2440/2440 | 2440/2440 | 2745/2745 | 2745/2745 | 2745/2745 |
| Width (Downflow/Horizontal flow) | (mm) | 1990/2143 | 1990/2143 | 1990/2143 | 2295/2295 | 2295/2295 | 2295/2295 |
| Height (Downflow/Horizontal flow) | (mm) | 2010/1960 | 2010/1960 | 2010/1960 | 2335/2265 | 2335/2265 | 2335/2265 |
| Weight (Downflow/Horizontal flow) | (kg) | 877/981 | 877/981 | 877/981 | 1288/1363 | 1288/1363 | 1288/1363 |
| Power Exhaust Fan (Option) | | | | | | | |
| Type | | Axial | Axial | Axial | Axial | Axial | Axial |
| Diameter | (mm) | 630 | 630 | 630 | 630 | 630 | 630 |
| Drive type | | Direct | Direct | Direct | Direct | Direct | Direct |
| Number/Voltage | # | 2/400V | 2/400V | 2/400V | 2/400V | 2/400V | 2/400V |
| Motor HP | (kW) | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| Motor Rated Amps (2) | (A) | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| Filters | | | | | | | |
| Type Furnished | | 2" Throwaway | 2" Throwaway | 2" Throwaway | 2" Throwaway | 2" Throwaway | 2" Throwaway |
| (No.) Size Recommended | | 16x (398x498x45) | 16x (398x498x45) | 16x (398x498x45) | 17x (398x498x45) | 17x (398x498x45) | 17x (398x498x45) |
| Operating limits | | | | | | | |
| Minimum operating outdoor air temp. (Cooling) | °C | -18 | -18 | -18 | -18 | -18 | -18 |
| Maximum operating outdoor air temp. (Cooling) | °C | 52 | 52 | 52 | 49 | 49 | 52 |
| Minimum intake air temp. on the indoor coil (Cooling) | °C | 16 | 16 | 16 | 16 | 16 | 16 |
| Minimum intake air temp. on the indoor coil (Heating) | °C | 5 | 5 | 5 | 5 | 5 | 5 |
| Dimensions (3) | | | | | | | |
| Length TKD/TKH | (mm) | 4580 | 4580 | 4580 | 5200 | 5200 | 5200 |
| YKD/YKH (Low heat) | (mm) | 4580 | 4580 | 4580 | 5900 | 5900 | 5900 |
| YKD/YKH (High heat) | (mm) | 5285 | 5285 | 5285 | 5900 | 5900 | 5900 |
| Width | (mm) | 2302 | 2302 | 2302 | 2302 | 2302 | 2302 |
| Height | (mm) | 2093 | 2093 | 2093 | 2268 | 2268 | 2268 |
| Operating weight TKD/TKH | (kg) | 1625 | 1629 | 1655.5 | 2055 | 2114 | 2241 |
| YKD/YKH (Low heat) | (kg) | 1668 | 1684 | 1714.5 | 2169 | 2227 | 2494 |
| YKD/YKH (High heat) | (kg) | 1861 | 1871 | 1900.5 | 2225 | 2284 | 2551 |
| Shipping weight TKD/TKH | (kg) | 1725 | 1729 | 1755.5 | 2195 | 2254 | 2381 |
| YKD/YKH (Low heat) | (kg) | 1768 | 1784 | 1914.5 | 2309 | 2367 | 2634 |
| YKD/YKH (High heat) | (kg) | 1981 | 1991 | 2020.5 | 2365 | 2424 | 2691 |
| Unit construction | | | | | | | |
| Sheet metal/Thickness | Type/mm | GalvaSteel/1.2 | GalvaSteel/1.2 | GalvaSteel/1.2 | GalvaSteel/1.2 | GalvaSteel/1.2 | GalvaSteel/1.2 |
| Paint | Type/RAL | Polyester/9002 | Polyester/9002 | Polyester/9002 | Polyester/9002 | Polyester/9002 | Polyester/9002 |
| Insulation/Thickness | Type/mm | M0/25 | M0/25 | M0/25 | M0/25 | M0/25 | M0/25 |
| System Data | | | | | | | |
| Refrigerant circuit | # | 1 | 1 | 1 | 2 | 2 | 2 |
| Capacity steps | % | 0/50/100 | 0/46/100 | 0/50/100 | 0/37/63/100 | 0/33/66/100 | 0/45/55/100 |
| Refrigerant Charge | | | | | | | |
| Circuit A | (kg) | 20.7 | 20.7 | 21.0 | 7.0 | 7.0 | 18.5 |
| Circuit B | (kg) | - | - | - | 21.6 | 21.6 | 18.5 |

(1) At Eurovent rating conditions: Indoor return Air (27°C DB/19°C WB) - Ambient 35°C according to EN14511:2013.

(2) per motor under 400V.

(3) Max load amp for unit with oversized belt driven fan, with exhaust fan options, without electric heater.

(4) At the nominal airflow with oversized drive.

(5) Performance of Energy recovery module given for Indoor 19°C/50%/Outdoor Ambient -5°C.

(6) At 10m from the unit in a free field.

Electrical & refrigerant charge Data are subject to change without notice. Please refer to unit nameplate data.

General Data

Table 3 - General Data

| Reversible/Dual fuel unit | | WKD/WKH DKD/DKH 400 | WKD/WKH DKD/DKH 500 | WKD/WKH DKD/DKH 600 |
|---------------------------------------|---------------------|------------------------------------|------------------------------------|------------------------------------|
| Eurovent Performances (1) | | R410A | R410A | R410A |
| Net Cooling Capacity | (kW) | 115.5 | 136.2 | 156.1 |
| Total Power input in cooling | (kW) | 39.8 | 50.3 | 62.7 |
| EER | | 2.90 | 2.71 | 2.49 |
| Eurovent Efficiency class Cooling | | B | C | D |
| Main Power supply | V/Ph/ Hz | 400/3/50 | 400/3/50 | 400/3/50 |
| Net Heating Capacity | (kW) | 107.1 | 146.8 | 174.0 |
| Total Power input in Heating | (kW) | 32.3 | 44.1 | 52.4 |
| COP | | 3.32 | 3.33 | 3.32 |
| Eurovent Efficiency class Heating | | B | B | B |
| Outdoor sound power level env. | (dBA) | 90 | 90 | 91 |
| Indoor sound power level in duct | (dBA) | 87 | 87 | 88 |
| Outdoor sound pressure level env. (6) | (dBA) | 58 | 58 | 59 |
| Unit amps | | | | |
| Unit max amps (3) | (A) | 117 | 148 | 162 |
| Unit start up amps (3) | (A) | 293 | 357 | 424 |
| Unit power factor (1) | | 0.78 | 0.72 | 0.76 |
| Short circuit current | (kA) | 10 | 10 | 10 |
| Electric Heater (WKD/WKH) | | | | |
| Heating Capacity | (kW) | 62.5 | 75 | 75 |
| Capacity steps | (kW) | 25/37.5 | 37.5/37.5 | 37.5/37.5 |
| Rated Amps | (A) | 90.2 | 108.3 | 108.3 |
| Gas burner (DKD/DKH) | | | | |
| Staged Low heat version | | | | |
| Heating Input (G20) | (kW) | 85 | 85 | 85 |
| Heating Output (G20) | (kW) | 77.4 | 77.4 | 77.4 |
| Steady State Efficiency | (%) | 91 | 91 | 91 |
| No. Burners | # | 1 | 1 | 1 |
| No. Stages | # | 2 | 2 | 2 |
| Gas Connection Pipe Size | | 3/4" NPT | 3/4" NPT | 3/4" NPT |
| Staged High heat version | | | | |
| Heating Input (G20) | (kW) | 170 | 170 | 170 |
| Heating Output (G20) | (kW) | 154.8 | 154.8 | 154.8 |
| Steady State Efficiency | (%) | 91 | 91 | 91 |
| No. Burners | # | 2 | 2 | 2 |
| No. Stages | # | 2 | 2 | 2 |
| Gas Connection Pipe Size | | 1" NPT | 1" NPT | 1" NPT |
| Compressor | | | | |
| Number | # | 2 | 2 | 2 |
| Type | | Scroll | Scroll | Scroll |
| Model | | 20T/20T | 25T/25T | 30T/30T |
| Rated Amps (1) | (A) | 39.7/39.7 | 51.2/51.2 | 58.0/58.0 |
| Locked rotor Amps (2) | (A) | 215/215 | 260/260 | 320/320 |
| Outdoor Coil | | | | |
| Type | | Wavy | Wavy | Wavy |
| Tube Size OD | (mm) | 9.52 | 9.52 | 9.52 |
| Face Area | (m ²) | 6.3 | 6.3 | 6.3 |
| Rows/Fin series | #/FPF | 3/168 | 3/168 | 3/168 |
| Refrigerant Control | | TXV | TXV | TXV |
| Indoor Coil | | | | |
| Type | | Wavy | Wavy | Wavy |
| Tube Size OD | (mm) | 9.52 | 9.52 | 9.52 |
| Face Area | (m ²) | 3.4 | 3.4 | 3.4 |
| Rows/Fin series | #/FPF | 4/180 | 4/180 | 4/180 |
| Refrigerant Control | | TXV | TXV | TXV |
| Drain Connection No./Size | (mm) | 1/32mm | 1/32mm | 1/32mm |
| Outdoor Fan | | | | |
| Nominal Airflow | (m ³ /h) | 50600 | 48100 | 48100 |
| Type | | Axial | Axial | Axial |
| Diameter | (mm) | 710 | 710 | 710 |
| Drive type | | Direct | Direct | Direct |
| Number/Voltage | #/V | 4/400V | 4/400V | 4/400V |
| Motor HP | (kW) | 1.1 | 1.1 | 1.1 |
| Motor Rated Amps (1) | (A) | 2.5 | 2.5 | 2.5 |
| Motor RPM | (rpm) | 915 | 915 | 915 |



General Data

Table 3 - General Data (Cont.)

| Indoor Fan | | | | |
|---|---------------------|-----------------|-----------------|-----------------|
| Minimum Airflow | (m3/h) | 16320 | 19680 | 23600 |
| Nominal Airflow | (m3/h) | 20400 | 24600 | 29500 |
| Maximum Airflow | (m3/h) | 24480 | 29520 | 35400 |
| Static pressure available (4) | (Pa) | 590 | 600 | 600 |
| Type | | FC Centrifugal | FC Centrifugal | FC Centrifugal |
| Number | # | 1 | 1 | 1 |
| Diameter/Width | (in/in) | 25"/25" | 25"/25" | 25"/25" |
| Belt driven fan version | | | | |
| Motor HP (Standard/Oversized) | (kW) | 5.5/11 | 5.5/15 | 5.5/15 |
| Motor Rated Amps (Standard/Oversized) | (A) | 11.1/21.0 | 11.1/28.8 | 11.1/28.8 |
| Motor Locked rotor Amps (Standard/Oversized) | (A) | 70/162 | 70/216 | 70/216 |
| Motor RPM (Standard/Oversized) | (rpm) | 1450/1450 | 1450/1450 | 1450/1450 |
| Direct driven fan version | | | | |
| Motor HP (Standard/Oversized) | (kW) | 11/15 | 11/15 | 11/15 |
| Motor Max Amps (Standard/Oversized) | (A) | 18.2/25.6 | 18.2/25.6 | 18.2/25.6 |
| Motor RPM (Standard/Oversized) | (rpm) | 970/973 | 970/973 | 970/973 |
| Energy Recovery Module (5) | | | | |
| Plate Heat exchanger version | | | | |
| Thermal efficiency at 10%/50% fresh air | (%) | 61%/58% | 61%/58% | 61%/57% |
| Air pressure drop at 10%/50% fresh air | (Pa) | 2Pa/38Pa | 3Pa/54Pa | 4Pa/75Pa |
| Exhaust fan kW at 10%/50% fresh air | (kW) | 0.5kW/0.7kW | 0.5kW/1kW | 0.5kW/1.4kW |
| Length (Downflow/Horizontal flow) | (mm) | 3050/3335 | 3050/3335 | 3050/3335 |
| Width (Downflow/Horizontal flow) | (mm) | 2295/2295 | 2295/2295 | 2295/2295 |
| Height (Downflow/Horizontal flow) | (mm) | 2010/1960 | 2010/1960 | 2010/1960 |
| Weight (Downflow/Horizontal flow) | (kg) | 1155/1240 | 1155/1240 | 1155/1240 |
| Rotary Wheel Heat exchanger version | | | | |
| Thermal efficiency at 10%/50% fresh air | (%) | 85%/71% | 84%/68% | 83%/64% |
| Air pressure drop at 10%/50% fresh air | (Pa) | 13Pa/91Pa | 16Pa/114Pa | 20Pa/143Pa |
| Exhaust fan kW at 10%/50% fresh air | (kW) | 0.5kW/0.8kW | 0.5kW/1kW | 0.5kW/1.4kW |
| Length (Downflow/Horizontal flow) | (mm) | 2745/2745 | 2745/2745 | 2745/2745 |
| Width (Downflow/Horizontal flow) | (mm) | 2295/2295 | 2295/2295 | 2295/2295 |
| Height (Downflow/Horizontal flow) | (mm) | 2335/2265 | 2335/2265 | 2335/2265 |
| Weight (Downflow/Horizontal flow) | (kg) | 1288/1363 | 1288/1363 | 1288/1363 |
| Power Exhaust Fan (Option) | | | | |
| Type | | Axial | Axial | Axial |
| Diameter | (mm) | 660 | 660 | 660 |
| Drive type | | Direct | Direct | Direct |
| Number/Voltage | #/V | 2/400V | 2/400V | 2/400V |
| Motor HP | (kW) | 0.75 | 0.75 | 0.75 |
| Motor Rated Amps (2) | (A) | 2.9 | 2.9 | 2.9 |
| Filters | | | | |
| Type Furnished | | 2" Throwaway | 2" Throwaway | 2" Throwaway |
| (No.) Size Recommended | | 17x(398x498x45) | 17x(398x498x45) | 17x(398x498x45) |
| Operating limits | | | | |
| Minimum operating outdoor air temp. (Cooling) | °C | -18 | -18 | -18 |
| Minimum operating outdoor air temp. (Heating) | °C | -15 | -15 | -15 |
| Maximum operating outdoor air temp. (Cooling) | °C | 52 | 52 | 52 |
| Maximum operating outdoor air temp. (Heating) | °C | 18 | 18 | 18 |
| Minimum intake air temp. on the indoor coil (Cooling) | °C | 16 | 16 | 16 |
| Minimum intake air temp. on the indoor coil (Heating) | °C | 10 | 10 | 10 |
| Dimensions (3) | | | | |
| Length | WKD/WKH | (mm) | 5200 | 5200 |
| | DKD/DKH | (mm) | 5900 | 5900 |
| Width | | (mm) | 2302 | 2302 |
| | | (mm) | 2302 | 2302 |
| Height | | (mm) | 2268 | 2268 |
| | | (mm) | 2268 | 2268 |
| Operating Weight | WKD/WKH | (kg) | 2081 | 2282 |
| | DKD/DKH (Low heat) | (kg) | 2195 | 2395 |
| | DKD/DKH (High heat) | (kg) | 2251 | 2452 |
| Shipping Weight | WKD/WKH | (kg) | 2221 | 2422 |
| | DKD/DKH (Low heat) | (kg) | 2335 | 2535 |
| | DKD/DKH (High heat) | (kg) | 2391 | 2592 |
| Unit construction | | | | |
| Sheet metal/Thickness | Type/mm | GalvaSteel/1.2 | GalvaSteel/1.2 | GalvaSteel/1.2 |
| Paint | Type/RAL | Polyester/9002 | Polyester/9002 | Polyester/9002 |
| Insulation/Thickness | Type/mm | M0/25 | M0/25 | M0/25 |
| System Data | | | | |
| Refrigerant circuit | # | 2 | 2 | 2 |
| Capacity steps (Cooling) | % | 0/50/100 | 0/50/100 | 0/50/100 |
| Capacity steps (Heating) | % | 0/50/100 | 0/50/100 | 0/50/100 |
| Refrigerant Charge (3) | | | | |
| Circuit A (WKD/WKH) | (kg) | 15.0 | 19.0 | 19.0 |
| Circuit B (WKD/WKH) | (kg) | 15.0 | 19.0 | 19.0 |

(1) At Eurovent rating conditions: Indoor return Air (27°C DB/19°C WB) - Ambient 35°C according to EN14511:2013.
 (2) per motor under 400V.
 (3) Max load amp for standard unit, with exhaust fan options, without electric heat.
 (4) At the nominal airflow with oversized drive.
 (5) Performance of Energy recovery module given for Indoor 19°C/50%/Outdoor Ambient -5°C.
 (6) At 10m from the unit in a free field.
 Electrical & refrigerant charge Data are subject to change without notice. Please refer to unit nameplate data.

Performance Data

Gas Burner Performance

Table 4 - Gas burner performance

| | | G250 | G350 | G400 | PCH150 |
|--------------------|------------|------|------|------|--------|
| YK* 275-300-350 | Low Heat | | 1 | | |
| YK* 275-300-350 | High Heat | 1 | 1 | | |
| DK-YK* 400-500-600 | Low Heat | | | 1 | |
| DK-YK* 400-500-600 | High Heat | | | 2 | |
| YK* 275-300-350 | Modulating | | | | 1 |
| YK* 400-500-600 | Modulating | | | | 1 |

| Burner | | G250 | G350 | G400 | PCH150 | |
|---|-----------------------------|---------------------|-------------|-------------|-------------|-------------|
| Natural Gas G20 (20 mbar) 34.02 MJ/m³ (15°C-1013) | | | | | | |
| Gas Flow (15C-1013 mbar) | (m3/h) | Nominal rate | 5.6 | 8.1 | 9 | 16.4 |
| | | Reduced rate | 5.08 | 8.13 | 8.47 | 4.66 |
| Heating Capacity | (kW) | Nominal rate | 48.2 | 69.3 | 77.4 | 145 |
| | | Reduced rate | 43.7 | 69.1 | 72.8 | 46.3 |
| Heating Rate | (kW) | Nominal rate | 53 | 77 | 85 | 155 |
| | | Reduced rate | 48 | 76.8 | 80 | 44 |
| Efficiency | % | Nominal rate | 90.9 | 90.0 | 91.1 | 93.5 |
| | | Reduced rate | 91 | 90 | 91 | 105.2 |
| Smoke analysis | G20-20mbar @ 400V-3-50Hz | CO% | <0.001% | <0.001% | <0.001% | <0.001% |
| | | NOx ppm | 19 ppm | 9 ppm | 46 ppm | 34 ppm |
| | | Nox mg/kWh | 33 | 16 | 81 | 60 |
| | | CO ₂ % | 8.5% | 9.7% | 9.6% | 8.7% |

| Burner | | G250 | G350 | G400 | PCH150 | |
|---|-----------------------------|---------------------|-------------|-------------|-------------|--------------|
| Natural Gas G25 (20 ou 25 mbar) 29.30 MJ/m³ (15°C-1013) | | | | | | |
| Gas Flow (15C-1013 mbar) | (m3/h) | Nominal rate | 5.3 | 8.2 | 8.8 | 19.07 |
| | | Reduced rate | 5.15 | 8.02 | 8.21 | 5.41 |
| Heating Capacity | (kW) | Nominal rate | 38.3 | 60.3 | 62.9 | 145 |
| | | Reduced rate | 37.5 | 58.5 | 59.5 | 46.3 |
| Heating Rate | (kW) | Nominal rate | 43 | 67 | 71.5 | 155 |
| | | Reduced rate | 41.9 | 65.3 | 66.8 | 44 |
| Efficiency | % | Nominal rate | 89 | 90 | 88 | 93.5 |
| | | Reduced rate | 89 | 90 | 89 | 105.2 |
| Smoke analysis | G25-25mbar @ 400V-3-50Hz | CO% | <0.050% | <0.001% | <0.001% | <0.001% |
| | | NOx ppm | - | - | - | 34 ppm |
| | | Nox mg/kWh | - | - | - | 61 |
| | | CO ₂ % | 7.1% | 7.0% | 7.4% | 8.7% |

| Burner | | G250 | G350 | G400 | PCH150 | |
|---|-----------------------------|---------------------|-------------|-------------|-------------|-------------|
| Natural Gas G31 (30, 37 ou 50 mbar) 88.00 MJ/m³ (15°C-1013) | | | | | | |
| Gas Flow (15 C-1013 mbar) | (m3/h) | Nominal rate | 2.2 | 2.7 | 3.5 | 6.32 |
| | | Reduced rate | 2.17 | 2.56 | 3.19 | 1.79 |
| Gas Flow (15 C-1013 mbar) | (kg/h) | Nominal rate | 4.2 | 5.1 | 6.6 | 9.83 |
| | | Reduced rate | 7.1 | 4.9 | 6.1 | 2.79 |
| Heating Capacity | (kW) | Nominal rate | 48.6 | 57.5 | 78.2 | 145 |
| | | Reduced rate | 47.7 | 55.3 | 71.8 | 46.3 |
| Heating Rate | (kW) | Nominal rate | 54 | 65.3 | 85 | 155 |
| | | Reduced rate | 53 | 62.6 | 78 | 44 |
| Efficiency | % | Nominal rate | 90 | 88 | 92 | 93.5 |
| | | Reduced rate | 90 | 88.3 | 92 | 105.2 |
| Combustion Air Flow (Avec E=25%) | (m3/h) | Nominal rate | 72 | 98 | 113 | 206 |
| | | Reduced rate | 71 | 93 | 103 | 59 |
| Smoke analysis | G20-20mbar @ 400V-3-50Hz | CO% | <0.001% | <0.001% | 0.002% | <0.001% |
| | | NOx ppm | - | - | - | 34 ppm |
| | | Nox mg/kWh | - | - | - | 59 |
| | | CO ₂ % | 9.3% | 8.9% | 12.0% | 9.4% |



Performance Data

Supply fan performances

Table 5 - Supply fan drive selections

| | 5.5kW | | 7.5kW | | 11kW | | 15kW | |
|---------|------------|-----|------------|-----|------------|-----|------------|-----|
| | drive type | RPM | drive type | RPM | drive type | RPM | drive type | RPM |
| 275-300 | A = | 460 | | | | | | |
| | C = | 520 | | | | | | |
| | D = | 580 | | | | | | |
| | | | E = | 650 | | | | |
| | | | G = | 725 | | | | |
| 350 | A = | 460 | | | | | | |
| | C = | 520 | | | | | | |
| | D = | 580 | | | | | | |
| | | | E = | 650 | | | | |
| | | | G = | 725 | G = | 725 | | |
| 400 | H = | 415 | | | | | | |
| | | | K = | 465 | | | | |
| | | | L = | 515 | | | | |
| | | | | | M = | 610 | | |
| | | | | | N = | 685 | | |
| 500 | H = | 415 | | | | | | |
| | | | K = | 465 | | | | |
| | | | L = | 515 | | | | |
| | | | | | M = | 610 | | |
| | | | | | N = | 685 | N = | 685 |
| 600 | | | K = | 465 | | | | |
| | | | L = | 515 | | | | |
| | | | | | M = | 610 | M = | 610 |
| | | | | | N = | 685 | N = | 685 |
| | | | | | | | P = | 737 |

Performance Data

Sound levels

Data given at 300Pa and 35°C ambient
Sound Power Reference = 10E--12 Watt

Table 6 - Overall Outdoor Sound Power Level (Env.)

| | | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | |
|---------------|-----|----------|----------|----------|----------|----------|----------|----------|----------|--------|
| TKD/H - YKD/H | 275 | 74.7 dBA | 73.9 dBA | 78.5 dBA | 82.2 dBA | 83.1 dBA | 79.3 dBA | 71.9 dBA | 56.7 dBA | 88 dBA |
| TKD/H - YKD/H | 300 | 74.9 dBA | 74.1 dBA | 78.7 dBA | 83.0 dBA | 83.6 dBA | 80.5 dBA | 73.7 dBA | 56.9 dBA | 88 dBA |
| TKD/H - YKD/H | 350 | 74.9 dBA | 74.1 dBA | 78.8 dBA | 83.5 dBA | 83.8 dBA | 81.3 dBA | 74.9 dBA | 56.9 dBA | 89 dBA |
| TKD/H - YKD/H | 400 | 75.8 dBA | 75.1 dBA | 79.8 dBA | 84.6 dBA | 84.9 dBA | 82.2 dBA | 75.5 dBA | 57.7 dBA | 90 dBA |
| TKD/H - YKD/H | 500 | 75.9 dBA | 75.3 dBA | 80.0 dBA | 85.3 dBA | 85.9 dBA | 82.2 dBA | 75.4 dBA | 57.9 dBA | 90 dBA |
| TKD/H - YKD/H | 600 | 76.0 dBA | 75.3 dBA | 80.0 dBA | 85.6 dBA | 86.1 dBA | 82.6 dBA | 75.5 dBA | 57.9 dBA | 91 dBA |
| WKD/H - DKD/H | 400 | 75.8 dBA | 75.1 dBA | 79.8 dBA | 84.0 dBA | 84.7 dBA | 84.9 dBA | 77.3 dBA | 57.7 dBA | 90 dBA |
| WKD/H - DKD/H | 500 | 76.0 dBA | 75.3 dBA | 80.0 dBA | 85.1 dBA | 85.4 dBA | 82.8 dBA | 75.8 dBA | 57.9 dBA | 90 dBA |
| WKD/H - DKD/H | 600 | 75.9 dBA | 75.3 dBA | 80.0 dBA | 86.0 dBA | 86.8 dBA | 82.4 dBA | 75.2 dBA | 57.9 dBA | 91 dBA |

Table 7 - SUPPLY Indoor Sound Power level (In duct)

| | | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | |
|---------------|-----|----------|----------|----------|----------|----------|----------|----------|----------|--------|
| TKD/H - YKD/H | 275 | 56.5 dBA | 63.9 dBA | 67.9 dBA | 78.6 dBA | 71.9 dBA | 70.1 dBA | 65.9 dBA | 59.8 dBA | 80 dBA |
| TKD/H - YKD/H | 300 | 57.0 dBA | 64.4 dBA | 68.4 dBA | 79.1 dBA | 72.4 dBA | 70.6 dBA | 66.4 dBA | 60.3 dBA | 81 dBA |
| TKD/H - YKD/H | 350 | 58.0 dBA | 65.4 dBA | 69.4 dBA | 80.1 dBA | 73.4 dBA | 71.6 dBA | 67.4 dBA | 61.3 dBA | 82 dBA |
| TKD/H - YKD/H | 400 | 58.9 dBA | 68.3 dBA | 72.4 dBA | 82.1 dBA | 75.4 dBA | 73.6 dBA | 67.4 dBA | 60.2 dBA | 84 dBA |
| TKD/H - YKD/H | 500 | 58.5 dBA | 68.9 dBA | 72.9 dBA | 81.6 dBA | 75.9 dBA | 74.1 dBA | 69.9 dBA | 62.8 dBA | 84 dBA |
| TKD/H - YKD/H | 600 | 58.1 dBA | 69.5 dBA | 73.4 dBA | 81.1 dBA | 76.4 dBA | 74.6 dBA | 72.4 dBA | 65.4 dBA | 84 dBA |
| WKD/H - DKD/H | 400 | 58.9 dBA | 68.3 dBA | 72.4 dBA | 82.1 dBA | 75.4 dBA | 73.6 dBA | 67.4 dBA | 60.2 dBA | 84 dBA |
| WKD/H - DKD/H | 500 | 58.5 dBA | 68.9 dBA | 72.9 dBA | 81.6 dBA | 75.9 dBA | 74.1 dBA | 69.9 dBA | 62.8 dBA | 84 dBA |
| WKD/H - DKD/H | 600 | 58.1 dBA | 69.5 dBA | 73.4 dBA | 81.1 dBA | 76.4 dBA | 74.6 dBA | 72.4 dBA | 65.4 dBA | 84 dBA |

Table 8 - RETURN Indoor Sound Power level (In duct)

| | | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | |
|---------------|-----|----------|----------|----------|----------|----------|----------|----------|----------|--------|
| TKD/H - YKD/H | 275 | 56.5 dBA | 63.9 dBA | 67.9 dBA | 78.6 dBA | 71.9 dBA | 70.1 dBA | 65.9 dBA | 59.8 dBA | 80 dBA |
| TKD/H - YKD/H | 300 | 57.0 dBA | 64.4 dBA | 68.4 dBA | 79.1 dBA | 72.4 dBA | 70.6 dBA | 66.4 dBA | 60.3 dBA | 81 dBA |
| TKD/H - YKD/H | 350 | 58.0 dBA | 65.4 dBA | 69.4 dBA | 80.1 dBA | 73.4 dBA | 71.6 dBA | 67.4 dBA | 61.3 dBA | 82 dBA |
| TKD/H - YKD/H | 400 | 58.9 dBA | 68.3 dBA | 72.4 dBA | 82.1 dBA | 75.4 dBA | 73.6 dBA | 67.4 dBA | 60.2 dBA | 84 dBA |
| TKD/H - YKD/H | 500 | 58.5 dBA | 68.9 dBA | 72.9 dBA | 81.6 dBA | 75.9 dBA | 74.1 dBA | 69.9 dBA | 62.8 dBA | 84 dBA |
| TKD/H - YKD/H | 600 | 58.1 dBA | 69.5 dBA | 73.4 dBA | 81.1 dBA | 76.4 dBA | 74.6 dBA | 72.4 dBA | 65.4 dBA | 84 dBA |
| WKD/H - DKD/H | 400 | 58.9 dBA | 68.3 dBA | 72.4 dBA | 82.1 dBA | 75.4 dBA | 73.6 dBA | 67.4 dBA | 60.2 dBA | 84 dBA |
| WKD/H - DKD/H | 500 | 58.5 dBA | 68.9 dBA | 72.9 dBA | 81.6 dBA | 75.9 dBA | 74.1 dBA | 69.9 dBA | 62.8 dBA | 84 dBA |
| WKD/H - DKD/H | 600 | 58.1 dBA | 69.5 dBA | 73.4 dBA | 81.1 dBA | 76.4 dBA | 74.6 dBA | 72.4 dBA | 65.4 dBA | 84 dBA |

Electrical Data

Table 9 - Maximum length

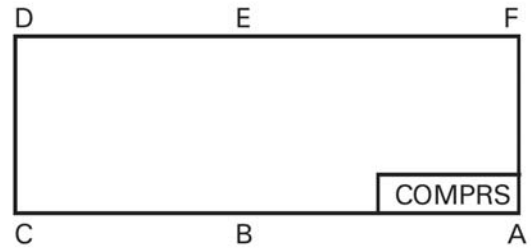
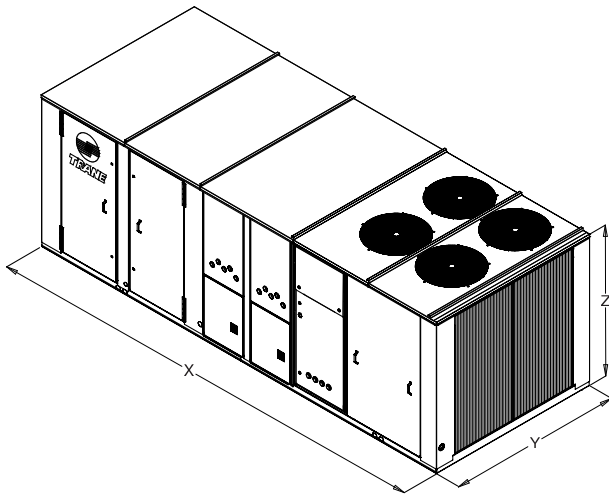
Zone sensor wire size

| | Wire size (mm ²) | Maximum wire length (m) |
|--------------------------------|---------------------------------|-------------------------------|
| THS/THP 03 | 0.33 | 45 |
| | 0.5 | 76 |
| | 0.75 | 115 |
| | 1.3 | 185 |
| | 2 | 300 |
| Conventional thermostat | 0.33 | 10 |
| | 0.5 | 15 |
| | 0.75 | 23 |
| | 1.3 | 37 |
| | 2 | 60 |
| CO2 sensor wire size | Wire size (mm ²) | Maximum wire length (m) |
| | 0.25 | 50 |
| | 0.5 | 100 |
| | 1 | 200 |

Dimensions and Weights

Overall unit dimensions, shipping weights and operating weights are given in the General Data tables.

Table 10 - Dimensions, Weights and Clearances



| Unit size | Dimensions (mm) | | | Shipping weight (kg) | Operating weight (kg) | Minimum clearances (mm) | | | | | Point loading weight | | | | | |
|---------------|-----------------|------|------|----------------------|-----------------------|-------------------------|------|------|------|------|----------------------|--------|--------|--------|--------|--------|
| | X | Y | Z | | | A | B | C | D | E | A (kg) | B (kg) | C (kg) | D (kg) | E (kg) | F (kg) |
| YKD/YKH 275 L | 4580 | 2302 | 2093 | 1768 | 1668 | 1900 | 2440 | 1220 | 1220 | 1830 | 384 | 384 | 217 | 234 | 217 | 232 |
| YKD/YKH 300 L | 4580 | 2302 | 2093 | 1784 | 1684 | 1900 | 2440 | 1220 | 1220 | 1830 | 387 | 387 | 219 | 236 | 219 | 236 |
| YKD/YKH 350 L | 4580 | 2302 | 2093 | 1915 | 1715 | 1900 | 2440 | 1220 | 1220 | 1830 | 394 | 394 | 223 | 240 | 223 | 241 |
| YKD/YKH 400 L | 5900 | 2302 | 2268 | 2309 | 2169 | 1900 | 2440 | 1220 | 1220 | 1830 | 499 | 499 | 282 | 304 | 282 | 303 |
| YKD/YKH 500 L | 5900 | 2302 | 2268 | 2367 | 2227 | 1900 | 2440 | 1220 | 1220 | 1830 | 512 | 512 | 290 | 312 | 290 | 311 |
| YKD/YKH 600 L | 5900 | 2302 | 2268 | 2634 | 2494 | 1900 | 2440 | 1220 | 1220 | 1830 | 574 | 574 | 324 | 349 | 324 | 349 |
| YKD/YKH 275 H | 5285 | 2302 | 2093 | 1981 | 1861 | 1900 | 2440 | 1220 | 1220 | 1830 | 428 | 428 | 242 | 261 | 242 | 260 |
| YKD/YKH 300 H | 5285 | 2302 | 2093 | 1991 | 1871 | 1900 | 2440 | 1220 | 1220 | 1830 | 430 | 430 | 243 | 262 | 243 | 263 |
| YKD/YKH 350 H | 5285 | 2302 | 2093 | 2021 | 1901 | 1900 | 2440 | 1220 | 1220 | 1830 | 437 | 437 | 247 | 266 | 247 | 267 |
| YKD/YKH 400 H | 5900 | 2302 | 2268 | 2365 | 2225 | 1900 | 2440 | 1220 | 1220 | 1830 | 512 | 512 | 289 | 312 | 289 | 311 |
| YKD/YKH 500 H | 5900 | 2302 | 2268 | 2424 | 2284 | 1900 | 2440 | 1220 | 1220 | 1830 | 525 | 525 | 297 | 320 | 297 | 320 |
| YKD/YKH 600 H | 5900 | 2302 | 2268 | 2691 | 2551 | 1900 | 2440 | 1220 | 1220 | 1830 | 587 | 587 | 332 | 357 | 332 | 356 |
| TKD/TKH 275 | 4580 | 2302 | 2093 | 1725 | 1625 | 1900 | 2440 | 1220 | 1220 | 1830 | 374 | 374 | 211 | 228 | 211 | 227 |
| TKD/TKH 300 | 4580 | 2302 | 2093 | 1729 | 1629 | 1900 | 2440 | 1220 | 1220 | 1830 | 375 | 375 | 212 | 228 | 212 | 227 |
| TKD/TKH 350 | 4580 | 2302 | 2093 | 1756 | 1656 | 1900 | 2440 | 1220 | 1220 | 1830 | 381 | 381 | 215 | 232 | 215 | 231.5 |
| TKD/TKH 400 | 5200 | 2302 | 2268 | 2195 | 2055 | 1900 | 2440 | 1220 | 1220 | 1830 | 473 | 473 | 267 | 288 | 267 | 287 |
| TKD/TKH 500 | 5200 | 2302 | 2268 | 2254 | 2114 | 1900 | 2440 | 1220 | 1220 | 1830 | 486 | 486 | 275 | 296 | 275 | 296 |
| TKD/TKH 600 | 5200 | 2302 | 2268 | 2381 | 2241 | 1900 | 2440 | 1220 | 1220 | 1830 | 515 | 515 | 291 | 314 | 291 | 315 |
| WKD/WKH 400 | 5200 | 2302 | 2268 | 2221 | 2081 | 1900 | 2440 | 1220 | 1220 | 1830 | 479 | 354 | 250 | 229 | 333 | 436 |
| WKD/WKH 500 | 5200 | 2302 | 2268 | 2422 | 2282 | 1900 | 2440 | 1220 | 1220 | 1830 | 525 | 388 | 274 | 251 | 365 | 479 |
| WKD/WKH 600 | 5200 | 2302 | 2268 | 2437 | 2297 | 1900 | 2440 | 1220 | 1220 | 1830 | 528 | 390 | 276 | 253 | 368 | 482 |
| DKD/DKH 400 L | 5900 | 2302 | 2268 | 2335 | 2195 | 1900 | 2440 | 1220 | 1220 | 1830 | 505 | 373 | 263 | 241 | 351 | 462 |
| DKD/DKH 500 L | 5900 | 2302 | 2268 | 2535 | 2395 | 1900 | 2440 | 1220 | 1220 | 1830 | 551 | 407 | 287 | 263 | 383 | 504 |
| DKD/DKH 600 L | 5900 | 2302 | 2268 | 2690 | 2550 | 1900 | 2440 | 1220 | 1220 | 1830 | 587 | 434 | 306 | 281 | 408 | 534 |
| DKD/DKH 400 H | 5900 | 2302 | 2268 | 2391 | 2251 | 1900 | 2440 | 1220 | 1220 | 1830 | 518 | 383 | 270 | 248 | 360 | 472 |
| DKD/DKH 500 H | 5900 | 2302 | 2268 | 2592 | 2452 | 1900 | 2440 | 1220 | 1220 | 1830 | 564 | 417 | 294 | 270 | 392 | 515 |
| DKD/DKH 600 H | 5900 | 2302 | 2268 | 2747 | 2607 | 1900 | 2440 | 1220 | 1220 | 1830 | 600 | 443 | 313 | 287 | 417 | 547 |



Dimensions and Weights

Weights of factory-installed accessories

Net weights should be added to unit weight when ordering factory-installed accessories. To estimate shipping weight, add 2.3kg to net weight.

Table 11 - Factory -installed accessories net weights (kg)

| UNIT | Size | Standard Roofcurb | Pitched Roofcurb | Barometric Relief | Power Exhaust | Oversized Supply Fan Motor | 0-25% Man Damper | Economizer | Elec. Heat | Hot Water Coil | Direct driven fan (standard motor) |
|-----------------|------|-------------------|------------------|-------------------|---------------|----------------------------|------------------|------------|------------|----------------|------------------------------------|
| TKD/TKH | 275 | 225 | 315 | 50/65 | 78/94 | 54 | 23 | 117/128 | 100 | 89 | 43 |
| TKD/TKH | 300 | 225 | 315 | 50/65 | 78/94 | 54 | 23 | 117/128 | 100 | 89 | 43 |
| TKD/TKH | 350 | 225 | 315 | 50/65 | 78/94 | 54 | 23 | 117/128 | 100 | 89 | 43 |
| TKD/TKH/WKD/WKH | 400 | 260 | 360 | 50/65 | 78/94 | 56 | 23 | 131/135 | 140 | 100 | 55 |
| TKD/TKH/WKD/WKH | 500 | 260 | 360 | 50/65 | 78/94 | 56 | 23 | 131/135 | 140 | 100 | 55 |
| TKD/TKH/WKD/WKH | 600 | 260 | 360 | 50/65 | 78/94 | 56 | 23 | 131/135 | 140 | 100 | 55 |
| YKD/YKH | 275L | 225 | 315 | 50/65 | 78/94 | 54 | 23 | 117/128 | - | - | 43 |
| YKD/YKH | 275H | 250 | 345 | 50/66 | 78/94 | 54 | 23 | 117/128 | - | - | 43 |
| YKD/YKH | 300L | 225 | 315 | 50/65 | 78/94 | 54 | 23 | 117/128 | - | - | 43 |
| YKD/YKH | 300H | 250 | 345 | 50/66 | 78/94 | 54 | 23 | 117/128 | - | - | 43 |
| YKD/YKH | 350L | 225 | 315 | 50/65 | 78/94 | 54 | 23 | 117/128 | - | - | 43 |
| YKD/YKH | 350H | 250 | 345 | 50/66 | 78/94 | 54 | 23 | 117/128 | - | - | 43 |
| YKD/YKH/DKD/DKH | 400 | 270 | 380 | 50/65 | 78/94 | 56 | 23 | 131/135 | - | - | 55 |
| YKD/YKH/DKD/DKH | 500 | 270 | 380 | 50/65 | 78/94 | 56 | 23 | 131/135 | - | - | 55 |
| YKD/YKH/DKD/DKH | 600 | 270 | 380 | 50/65 | 78/94 | 56 | 23 | 131/135 | - | - | 55 |

Notes:

Net weight should be added to unit weight when ordering factory installed accessories.

Table 12 - Filter arrangement

| UNIT | Standard | | 2" EU4 - AR500 | | 4" EU4 - AR500 | |
|------|----------|--------------|----------------|--------------|----------------|--------------|
| | Quantity | Size | Quantity | Size | Quantity | Size |
| 275 | 16 | (395x497x45) | 16 | (395x495x45) | 16 | (395x495x90) |
| 300 | 16 | (395x497x45) | 16 | (395x495x45) | 16 | (395x495x90) |
| 350 | 16 | (395x497x45) | 16 | (395x495x45) | 16 | (395x495x90) |
| 400 | 17 | (395x497x45) | 17 | (395x495x45) | 17 | (395x495x90) |
| 500 | 17 | (395x497x45) | 17 | (395x495x45) | 17 | (395x495x90) |
| 600 | 17 | (395x497x45) | 17 | (395x495x45) | 17 | (395x495x90) |

Equipment protection/operation

Timings and Features

Increased Reliability

Fewer components (moving electromechanical parts); less likelihood of equipment down time or failure. Standard.

Proportional Integral (PI) Control

Proportional - sets corrective action proportional to deviation from setpoint. Integral - fine-tunes the rate of corrective action proportional to the error (results in superior temperature control). Standard.

Built In "TEST" Mode

Aids in quick verification of system and control operation; exercises both hardware and software (no special tools required). Standard.

On Board Diagnostics

Assists with equipment troubleshooting if a problem should occur. Standard.

Low Ambient Start Timer (LAST) Function

Bypasses low pressure control when a compressor starts, eliminating nuisance compressor lockouts. Standard.

Anti Short Cycle Timer (ASCT) Function

Provides a three minute minimum "ON" time and a three minute minimum "OFF" time for compressors; enhances compressor reliability by ensuring proper oil return. Standard.

Time Delay Relay (TDR) Function

Provides an incremental staging delay between compressors; minimizes equipment current inrush and consumption by keeping compressors from starting simultaneously. Standard.

Built In Fan Delay Relay (FDR) Function

Provides custom indoor fan timing sequences for the different types of equipment, enhancing efficiency and reliability. Standard.

Built in Evaporator Defrost Control Function

Provides low ambient cooling down to -18°C. Standard.

Intelligent Fallback

Built-in Default Control provides adaptive operation, which allows the equipment to continue to operate, and provide comfort in the event of certain input failures. Also, allows temporary operation without a thermostat. Standard.

Emergency Stop Terminals on Low Voltage Terminal Board

Provides a convenient point to disable the equipment completely and immediately. Standard.

Lower Installation Cost

When using a Trane THS03 or THP03, control voltage wiring may be run up to five times further than any electromechanical system with no increase in wire section. Example: Electromechanical System - 22m using 0.5mm² wire. Microcontrol System (THS/P 03) 110m 0.5mm² wire. Standard.

Alternating Lead/Lag

During periods of part load operation, each compressor cycles alternately as circuit number one, equalizing compressor wear and run time. Enable by cutting the wire at RTRM junction number J3-8.

Demand defrost - Heat Pump

Defrost only if needed; not based on time like most other systems. Adapts to changing weather conditions and lowers operating costs. Standard.

Heat Pump Soft Start

Provides a smooth transition into heating after defrost, minimizing noise and compressor stress associated with switch over. Standard.

Heat Pump Smart Recovery and Smart Staging

Inhibits auxiliary heat operation if the space is recovering adequately (0.1°C/minute) with the heat pump alone, providing considerable savings in operating costs. Standard.

Economizer Preferred Cooling

Provides fully integrated operation. Will not turn on a compressor with the economizer, if the space is recovering adequately with the economizer alone (0.1°C./minute). Allows the equipment to be utilized in more varied applications. Standard with economizer.

Features lost when using a conventional thermostat

- When a Conventional Thermostat is applied, equipment operation differs significantly. The basic equipment protection features remain intact, and the following features end benefits are lost.
- Proportional Integral (PI) control is lost, equipment is controlled by a thermostat or generic building automation system device.
- Intelligent Fall Back is lost, if a failure occurs in the device controlling the equipment, operation will cease.
- Heat Pump Smart Recovery and Smart Staging is not available. Heat Pump operation becomes more costly unless the generic control applied can accomplish this.

Controls

Three-Phase Monitoring Relay

This device monitors three-phase power supply in order to protect unit motors.

This option is recommended when there are risks of power supply imbalance, phase reversal or when power factor correction capacitors are used.

The relay disables the unit control when one of the following failures occurs on power supply: phase reversal, phase loss, phase imbalance (adjustable setting). The recommended setting is as follows: 5% imbalance on 3-phase voltage. Duration of imbalance should be set at 5 seconds.

Figure 10



TD5 Service and Diagnostic User Display

The TD-5 display allows you to view data and make operational changes on Voyager rooftop equipped with Reliatel control v3.4 or above.

TD-5 is an 5" (127mm diagonal) high resolution color touch screen display

TD-5 provides in 26 languages:

- 15 different reports (3 custom, 12 standard)

- 12 different graphs (4 custom, 8 standard)

- View and reset Historic of last 100 detailed alarms.

Graph data can be exported to an excel file through USB memory stick.

Field-installed Control Options

Zone sensors

Zone sensors are the building occupants' comfort control devices. They replace the conventional electromechanical thermostats. Zones sensors are to be used with the Voyager™ II units with the Micro control. These sensors are available in the following options:

- THP03: Sensor, programmable setpoint and operation mode according to a schedule
- TZS01: Sensor only, used when connected with CCP2 or Tracker™
- TZS02: Sensor and setpoint adjustable thumbwheel
- THS03: Sensor, setpoint and operation mode, unit Led indication (mode and alarms)



From left to right TZS01, TZS02, THS03 THP03

Room thermostats

Trane Communication Interface (TCI)

This microprocessor interface allows the unit to communicate to Trane's Integrated Comfort™ system (CCP2, Tracker™).



THS03 room thermostat

Table 13 - Characteristics of programmable and conventional thermostats

| | Conv. Thermostat | THS03 | THP03 |
|--|--------------------|----------------|----------|
| Programmable | • | - | • |
| Control type design | • | - | • |
| Electronic | Electro-mechanical | | Reliatel |
| For cooling-only units (TS*/TK*) | • | • | • |
| For heat pump units (WS*/WK*) | • | • | • |
| For gas-fired units (YS*/YK*) | • | • | • |
| Number of cooling stages | 2 | 3 | 3 |
| Auxiliary heating stages (electric heater, hot water coil) | 2 | 2/1 Modulating | |
| Liquid crystal display | • | - | • |

LonMark® Communication Interface LCI-R

This microprocessor interface allows the unit to communicate to Trane's Integrated Comfort™ system (Tracer SC, Tracker™) or other open building automation systems

Tracker™ multi rooftops centralized control

- Intuitive, menu-driven user interface
- 2 wires cable communication with units (LonMark®)
- 365-day scheduling and 10 schedules
- Capability of including all equipment and devices in one schedule
- Temporary schedule override
- Easy-to-administer security system with two levels of access
- Automatic daylight savings time changeover
- Error and alarm messaging
- Setpoint viewing and editing
- Trend data collection
- Report generation
- Optimal start

Features exclusive to the PC software (optional)

- RJ45 - Ethernet connection
- Backup and restore capability
- Standard graphics and HTML graphical interface
- Binary output programming capability
- Operator-defined custom alarms capability
- Printer support

Connection to controllers over shared Ethernet/IP connection

- E-mail forwarding of alarms and messages
- Standard timed override (after hours) usage report
- Standard daily, monthly, and yearly energy reports

Note: The Tracker PC software is not needed to set up and operate a typical building.



Mechanical Specifications

General

Units shall be dedicated downflow or horizontal airflow. Operating range shall be between 50°C and -18°C cooling as standard for all units. All units shall be factory assembled, internally wired, fully charged with refrigerant, and 100 percent run-tested before leaving the factory. Wiring internal to the unit shall be colored and numbered for simplified identification.

Unit shall be available with a main refrigeration circuit in cooling only and reversible version. Auxiliary heat type shall be selectable: Hot water heat, Gas heater and electrical heater in both refrigeration circuit versions.

Performance

The unit with a capacity above 100kW shall be certified and registered on the Eurovent certification under RT program (<http://www.eurovent-certification.com>).

Casing

Unit casing shall be constructed of zinc coated, heavy-gauge, galvanized steel. All exterior components shall be mounted in a weather resistant steel cabinet and painted with a polyester white RAL 9002 powder paint. Where top cover seams exist, they shall be double hemmed and gasket sealed to prevent water leakage. Cabinet construction shall allow access for all maintenance on two sides of the unit. Service panels shall have handles and shall be removable while providing a water and air tight seal. The indoor air section shall be completely insulated with fire resistant, permanent, odorless glass fiber material, aluminum foil faced. The base of the unit shall have provisions for crane lifting.

Hinged Service Access + ¼ locks: Standard

Filter access panel and supply fan access panel shall be hinged for ease of unit service + ¼ turn locks shall be standard.

Electrical Control box upper access door shall deliver a protection against rain or snow during commissioning and maintenance operations.

Filters

Unit shall be provided on standard with 50 mm, throwaway EU3 filters. 50 mm EU4, 100 mm EU4 filters shall be optional.

Compressors

All units shall have Trane CSHD/CSHN scroll type compressors. Compressor shall be direct-drive, hermetic with self-lubrication. Motor shall be suction gas-cooled and shall have a voltage utilization range of plus or minus 10 percent of unit nameplate voltage. Internal temperature and current sensitive motor overloads shall be included for maximum protection. Each compressor shall be protected by external discharge temperature thermostat, winding temperature thermostat and reverse rotation/phase loss protection. Each compressor

shall have crankcase heaters installed, properly sized to minimize the amount of liquid refrigerant present in the oil sump during off cycles. All scroll compressors shall be provided with phase monitoring protection.

Refrigerant Circuits

The unit shall be operating with R410A HFC-based refrigerant. Each refrigerant circuit shall have independent thermostatic expansion devices, service pressure ports and refrigerant line filter driers factory-installed as standard. An area shall be provided for replacement suction line driers. Refrigeration circuit shall be protected against refrigerant leak by a low pressure switch. Service valves shall be provided as standard and located on low pressure and high pressure side of the refrigeration piping.

Evaporator and Condenser Coils

Condenser coils shall have 3/8" (10 mm) copper tubes mechanically bonded to lanced aluminum plate fins. Evaporator coils shall be 3/8" (13 mm) internally finned copper tubes mechanically bonded to high performance aluminum plate fins. All coils shall be leak tested at the factory to ensure pressure integrity. All coils shall be leak tested to 2.1 MPa and pressure tested to 4.5 MPa. All evaporator coils shall be of intermingled configuration. Sloped condensate drain pans are standard. Indoor coil shall be protected as standard on all units by an ant frost thermostat.

Outdoor Fans

The outdoor fans shall be direct drive, statically and dynamically balanced, draw-through in the vertical discharge position. The fan motors shall be permanently lubricated and shall have built-in thermal overload protection.

Indoor Fan

Units shall have belt driven, forward curved centrifugal fans with fixed motor sheaves. All motors shall be circuit breaker protected.

Controls

Unit shall be completely factory wired with necessary controls and terminal block for power wiring. Units shall provide an external location for mounting fused disconnect device. Unit controller shall be provided for all 24 volt control functions. The resident control algorithms shall make all heating, cooling and/or ventilating decisions in response to electronic signals from sensors measuring indoor and outdoor temperature. The control algorithm maintains accurate temperature control, minimizes drift from set point and provides better building comfort. Unit controller shall provide anti-short cycle timing and time delay between compressors to provide a higher level of machine protection. Heat pump unit shall manage defrost cycles based on demand defrost logic on the 2 independent circuits.

Mechanical Specifications

Electrical components and wiring shall be compliant with EN 60204-1 electrical directive. Unit shall be powered by 400V/3/50Hz supply (without neutral) on a single point of power connection.

Ventilation Override shall allow a binary input from the fire/life safety panel to cause the unit to override standard operation and assume one of two factory preset ventilation sequences, exhaust or pressurization. The two sequences shall be selectable based open a binary select input.

Phase monitoring relay: Standard

Unit shall detect phase loss, phase reversal from main power supply. In case of fault, the unit shall stop.

Through-The-Base Electrical Provision: Standard

An electrical service entrance shall be standard which allows access to route all high and low voltage electrical wiring inside the curb, through the bottom (vertically) and through the side (Horizontally) of the outdoor section of the unit and into the control box area.

Disconnect Switch: Standard

A factory installed disconnect switch with external handle shall be standard. The disconnect switch shall be mounted inside the unit control box. It should avoid power side access when switch is set in ON position.

Options and Accessories

Manual Fresh Air damper

A manually controllable outside air damper shall be adjustable for up to 25 percent outside air. Manual damper is set at desired position at unit start up.

Economizer

Economizer shall be factory installed. The assembly includes: fully modulating 0-100 percent motor and dampers, minimum position setting, preset linkage, wiring harness, and differential enthalpy control.

Barometric Relief

The barometric relief damper shall be optional with the economizer. It shall be available as a factory installed option on all units. Option shall provide a pressure operated damper for the purpose of space pressure equalization and be gravity closing to prohibit entrance of outside air during the equipment "off" cycle.

Power Exhaust Fan

Power exhaust shall be optional with the economizer. It shall be available as a factory installed option on all units. It shall assist the barometric relief damper in maintaining building pressurization.

Remote Potentiometer

A remote potentiometer shall be available to remotely adjust the unit economizer minimum position.

CO₂ Sensor

This accessory shall be compatible with economizer options. It shall measure CO₂ concentration in order to increase or decrease the fresh air amount in the building.

Variable Frequency Drives (VFDs)

VFDs shall be factory installed and tested to provide supply fan motor speed modulation. The VFD shall receive speed reference from the unit controller based upon supply zone heating/cooling demand and shall cause the drive to accelerate or decelerate as required to maintain the zone temperature setpoint. The fan coupling shall be direct type with the motor shaft. Units shall have a soft rubber direct coupling between centrifugal fans and motor. Motor, fan and VFD shall be individually replaced in case of maintenance operation.

Fan Fail Switch

This option allows checks for supply fan pressure. The fan failure switch will stop all unit functions and report Service alarm on the zone sensor module or Building management system.

Clogged Filter Switch

This option allows for individual dirty filter indication. The switch will light the Service LED on the zone sensor and will allow continued unit operation.

Smoke Detector

This option shall trip off in case of presence of smoke in the supply side of the unit and shall close the return air damper, if any, and stop the unit.

Phase Monitoring Relay

The phase monitoring relay shall detect phase loss, phase reversal and phase imbalance from main power supply. In case of fault, the unit must stop.

Black Epoxy Fin Coating

An optional coil corrosion resistant coating shall protect indoor and outdoor aluminum fins.

Fire Thermostats

Field installed manually resettable high temperature thermostats shall provide input to the unit controls to shut down the system if the temperature sensed at the return is 57°C or at the discharge 115°C.

Roof Curb – Downflow

The roof curb shall be designed to mate with the downflow unit and provide support and watertight installation when installed properly.

The roof curb design shall allow field fabricated rectangular supply/return ductwork to be connected directly to the curb.

Curb shall be shipped knocked down for field assembly.



Mechanical Specifications

Adjustable Roof Curb

This factory assembled accessory is adjustable on site and allows correction of the slope of the roof up to 5%.

Hot Water Coil

This option shall be factory mounted and placed in the discharge section. It shall be shipped with one 3-way valve, 0 to 100% modulating built-in control and freeze protection. If needed, on reversible unit, hot water coil shall be selected as first source of heat before mechanical heating.

Electric Heaters

Electric heat shall be available for factory installation within basic unit. Electric heater elements shall be constructed of heavy-duty nickel chromium elements we connected for 380 and 415 volt. Staging shall be achieved through the unit controller. Each heater package shall have automatically reset high limit control operating through heating element contactors. All heaters shall be individually fused from factory, where required.

Staged Gas Heater

The heating section shall have a drum and tube heat exchanger(s) design using corrosion resistant steel components. A forced combustion blower shall supply premixed fuel to a single burner ignited by a pilotless hot surface ignition system. In order to provide reliable operation, a negative pressure gas valve shall be used that requires blower operation to initiate gas flow. On an initial call for heat, the combustion blower shall purge the heat exchanger(s) 45 seconds before ignition. After three unsuccessful ignition attempts, the entire heating system shall be locked out until manually reset at the thermostat. Units shall be suitable for use with natural gas or propane (field installed kit). All units shall have two stage heating.

Burner of 48kW and 70kW shall have a no emissions of CO (<0.001%) and NOx emission below 30ppm (class 5 according to the requirements of Standard EN483)

Burner of 77kW shall have a no emissions of CO (<0.001%) and NOx emission below 50ppm (class 4 according to the requirements of Standard EN483)

Modulating Gas Heater

The gas burner should be modulating from 30% to 100%. Control of the burner should be delivered according to the heating demand and supply air temperature. Burner should be condensing below 60% heating output. Efficiency of the burner should be below 94% at full load and 105% at reduced load. Gas heat exchanger should be drum and tube type, build in stainless steel. A forced combustion blower shall supply premixed fuel to a single burner ignited by pilot burner integrated with spark ignition system. Premix burner shall have a no emissions of CO (0%) and NOx emission below 35ppm (class 5 according to the requirements of Standard EN483).

Energy Recovery Module - General

Heat recovery should include direct driven exhaust fan. Fan speed should be adjusted by a separate frequency drive according to fresh air flow in order to maintain building pressurization.

Fresh air flow shall be filtered before entering in the heat exchanger in order to prevent clogging on the fresh air side.

When free cooling is needed, energy recovery should be by-passed to avoid heat exchange on the fresh flow entering into the building.

Operation and Diagnostic Display

The unit shall be equipped with a 5" high resolution color touch screen LCD display. The display allows you to view data and make operational changes on the rooftop.

Display shall provide in 26 languages:

- 15 different reports (3 custom, 12 standard)
- 12 different graphs (4 custom, 8 standard)
- View and reset historic of last 100 detailed alarms.

Graph data shall be exported to an excel file through USB memory stick.

Energy Recovery Module - Plate heat exchanger version

Energy recovery module should have a total efficiency of 58% or higher at -5°C outdoor, 19°C indoor and 30% fresh air rate. Module shall be equipped with freeze monitoring pressure switch that initiate defrost cycle when exchanger is clogged by frost in winter application

Energy Recovery Module - Heat wheel version

Energy recovery should have a total efficiency of 70% or higher at -5°C outdoor, 19°C indoor and 30% fresh air rate. Fresh air and exhaust air flow shall be filtered before entering in the heat exchanger in order to prevent exchanger clogging.

Thermostats and Zone Sensors

The thermostats and zone sensors shall be provided to interface with the ReliaTel® unit controls and shall be available in either manual, automatic programmable with night setback, with system malfunction lights or remote sensor options.

Communication Interface (TCI-R)

ReliaTel® Trane Communication Interface (TCI) shall be provided to interface with the Trane Integrated Comfort™ System and shall be available as a field or factory-installed. The TCI shall allow control and monitoring of the rooftop unit via a two wires communication link. The following alarm and diagnostic information shall be available:

Mechanical Specifications

Trane Modbus Communication Interface (PIC)

Modbus Communication Interface (PIC) shall be provided to interface with the Trane Integrated Comfort™ System and shall be available field or factory-installed. The PIC shall allow control and monitoring of the rooftop unit via a two wire communication link and Modbus protocol. The following alarm and diagnostic information shall be available:

LonTalk® Communication Interface (LCI-R)

The field or factory-installed ReliaTel® LonTalk Communication Interface (LCI-R) will be provided to interface with the Trane Integrated Comfort™ System or LonTalk® capable third party building management networks. The LCI-R will allow control and monitoring of the rooftop unit via a two wires communication link.

Reliatel® Unit controller Originated Data

- Unit operating mode
- Unit failure status
 - Cooling failure
 - Heating failure
 - Emergency service stop indication
 - Supply fan proving
 - Timed override activation
 - High temperature thermostat status
- Zone temperature
- Supply air temperature
- Cooling status (all stages)
- Stage activated or not
- Stage locked out by Reliatel
- HPC status for that stage
- Compressor disable inputs
- Heating status
- Number of stages activated
- High temperature limit status
- Economizer status
- Requested minimum position
- Damper position
- Dry bulb/enthalpy input status
- Outside air temperature
- Outside relative humidity
- Sensor Failure
 - Humidity sensor
 - Outdoor Air Temperature sensor
 - Supply Air Temperature sensor
 - Return Air Temperature sensor
 - Zone temperature sensor
 - Mode input
 - Cooling/heating setpoint from sensors
 - Unit mounted potentiometer
- Unit Configuration data
 - Gas or electric heat
 - Economizer present
- Local setpoint

- Local mode setting
- Clogged filter service indicator
- CO₂ setpoint
- CO₂ value

Building Management System communication Originated Data

- Command operating mode
- Host controllable functions:
 - Supply fan
 - Economizer
 - Cooling stages enabled
 - Heating stages enabled
 - Emergency shutdown
- Minimum damper position
- Heating setpoint
- Cooling setpoint
- Supply air tempering enable/disable
- Slave mode (CV only)
- Tracer/Local operation
- Daytime warm-up enable/disable
- Power exhaust setpoint



Notes



Notes



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