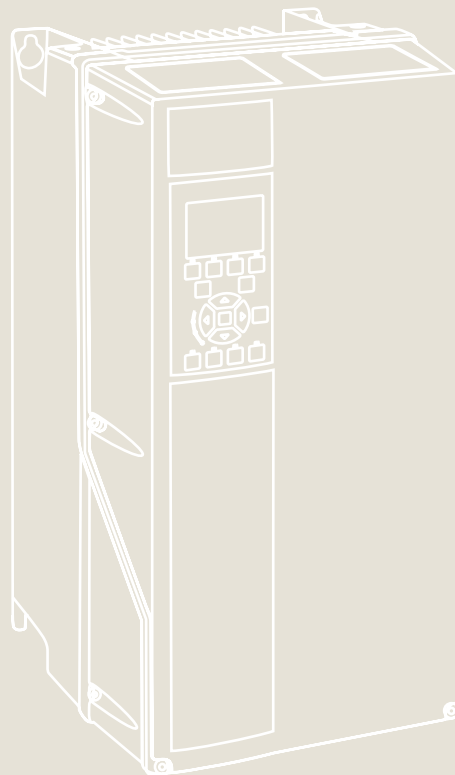




# VARIABLE FREQUENCY DRIVES TR200 SERIES

Drive your motor for energy savings



## ENERGY EFFICIENCY & RELIABILITY

*At Trane, our philosophy is grounded in a commitment to offering solutions that support energy efficiency and take a sustainable approach to the environment. We believe in creating High Performance Buildings.*



Trane TR200 Series drives play an important role in a system to reduce energy usage, extend motor life, optimize AC motor speed control, maximize occupant comfort and reduce costs. They are available factory-mounted and commissioned on Trane IntelliPak™, Voyager III™ and M-Series™ and T-Series™ Climate Changers. In addition, TR200 Series drives' support of open standard protocols make them compatible with virtually all HVAC equipment and building automation systems. They can also be ordered specifically for a project and easily installed on-site for new and retrofit applications. With a complete range available from 1½ to 1350 HP, the features and flexibility of TR200 Series drives make them ideal for stand-alone control of cooling towers, exhaust fans, pumps and a variety of air handlers.

### ENERGY SAVINGS

- **Automatic Energy Optimization (AEO)**—continually monitors the motor's speed and load to maximize energy savings.
- **Sleep mode**—stops the drive automatically whenever speed is outside set levels, providing energy savings.

### COST SAVINGS

- **Intelligent HVAC controller**—four auto-tuning PID loops reduce costs by eliminating external controllers.
- **Built-in HVAC protocols**—TR200 drives become an intelligent part of the building management system.

### TROUBLE-FREE OPERATION

- **Dual DC-link reactors**—non-saturating to provide better harmonic performance than 5% AC line reactors.
- **Automatic high ambient derate**—the drive can warn of overtemperature conditions while continuing to run, controlling its temperature by reducing the output carrier frequency and current.

### EASY TO INSTALL

- **Compact size**—reduced footprint of most popular sizes.
- **Run-permissive circuit**—assures that dampers or other auxiliary equipment are in the proper state for drive operation.
- **Real-time clock**—adds sophisticated performance to basic control schemes for increased comfort and energy savings.
- **Plenum rated**—all drives and options are UL listed for installation in air handling compartments.

### EASY TO USE

- **Simple, flexible menu**—pre-set default common parameters allow easy set-up and quick confirmation.
- **Trane Drive Utility software**—allows easy PC access for commissioning and troubleshooting via the drive's built-in USB port.
- **Advanced firefighter's override**—provides options for emergency operation that increase the safety of building inhabitants.



## HVAC INTEGRATION EXPERTISE

*Integrated Comfort™ systems are a single-source offering incorporating high-quality HVAC products and controls, backed by a trusted and experienced sales force and extensive service network. They can also encompass fire safety and security systems from a single source. Trane builds upon 30 years of experience in the controls industry and our firm commitment to new technology in practical, day-to-day applications. Our variable frequency drive, the TR200 Series, is an example of this commitment.*

### NETWORK COMMUNICATION

While offering single-source solutions, Trane stands committed to open-standard protocols to meet the needs of building professionals. The TR200 Series demonstrates this with “plug-and-play” communication capabilities that reduce or eliminate the need for integration gateways.

The TR200 support of major building communication protocols allows seamless communication with open standard protocols such as BACnet™, LonWorks™ and Modbus™ as well as other popular building automation system protocols. Whether factory-installed on Trane HVAC equipment, field-installed on new equipment, or retrofit on existing equipment, the result is an easily programmable drive in an easy-to-manage package that simplifies installation and results in a lower total cost of ownership.

### STAND-ALONE CAPABILITIES

The TR200 VFD's on-board control capabilities simplify system architecture by reducing or eliminating the need for an additional application controller. The TR200 Smart Logic Controller provides the power and flexibility to custom-program the drive to address a wide range of control requirements. Use the Trane Drive Utility software to graphically set up the 20-step state controller to perform simple application control.

The main closed-loop controller PID circuit allows three feedback signals for advanced control of stand-alone applications. The TR200 has three additional independent PID closed-loop controllers that allow the drive to directly monitor and control other equipment in the system, reducing costs.

### BYPASS OPTIONS

A higher level of system reliability is achieved by selecting either of the two available bypass options. Both bypass options feature a 24 VDC switch mode power supply that eliminates contactor dropout on voltage conditions as low as 70% of nominal voltage.

The electro-mechanical bypass option provides reliable bypass operation with advanced features such as a common run/stop in bypass mode, run permission, auto-bypass operation and a selectable bypass fire mode.

The electronically controlled bypass option allows single-button keypad access to drive and bypass operations. This option also allows for all drive communication and control capabilities to be available during bypass operation to maintain indoor environmental quality.



*TR200 keypad with one-touch access to bypass operation*



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## JUST AS IMPORTANT AS WHAT'S IN YOUR VFD...



## ...IS WHAT'S BEHIND IT

And behind every Trane Variable Frequency Drive you will find a world leader in HVAC equipment, controls and services. Whether preinstalled on Trane equipment, field applied or retrofit, the Trane TR Series VFD comes with the most important feature of all—our proven capabilities throughout the life of your facilities:

### Design

- Right application
- Right product

### Installation

- Properly installed
- On time

### Operation

- Meet or exceed expectations
- Performance savings

### Service

- Minimize downtime
- Provide support

We have a dedicated team of professionals located at over 150 local offices in the US and Canada and a network of over 200 parts centers to get you what you want, when you need it. To learn more about our drives and what's behind them, visit [www.trane.com/vfd](http://www.trane.com/vfd).

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Date

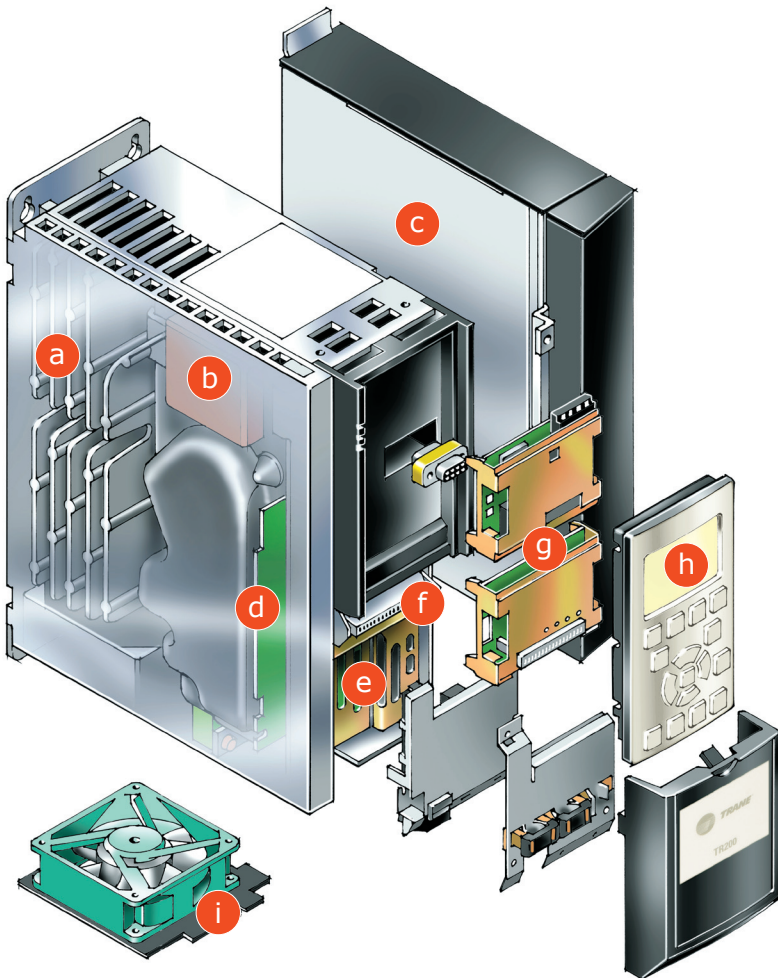
November 2008

Supersedes

New

For more information, contact your local Trane office or e-mail us at [comfort@trane.com](mailto:comfort@trane.com)

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- a** COLD PLATE COOLING TECHNOLOGY  
For efficient heat dissipation
- b** BALANCED DC-LINK REACTORS  
For reduced harmonics
- c** ADVANCED CONTROLLER OPTIONS  
Address the needs of complex applications
- d** SURFACE MOUNT COMPONENTS  
For compactness and reliability
- e** USB INTERFACE  
For easy connection to PC software suite
- f** REMOVABLE TERMINAL STRIPS  
Angled for easy access
- g** OPTION CARDS  
Provide additional functionality
- h** HOT-PLUGGABLE KEYPAD  
Features on-board memory with user-friendly ergonomic design
- i** REMOVABLE, TEMPERATURE-CONTROLLED FAN  
For easy servicing





# SPECIFICATIONS

## Drive Input Power

Input voltage, 3-phase..... 200–240, or 380–460, or 525–600 VAC  
 Input voltage range for full output..... Nominal  $\pm 10\%$   
 Undervoltage trip point ..... 164, 313 VAC, or 394 VAC  
 Overvoltage trip point..... 299, 538, or 690  
 (792 for 100 HP and above) VAC  
 Input frequency ..... 50 or 60 Hz,  $\pm 2$  Hz  
 Displacement power factor.... 0.98 or greater at all speeds and loads  
 Total power factor ..... 0.90 or greater at full load  
 and nominal motor speed

## Drive Output Power

Output frequency..... Selectable 0 to 120 Hz  
 Motor voltages ..... 200, 208, 220, 230; 380, 400,  
 415, 440, 460; 550 or 575 VAC  
 Continuous output current ..... 100% rated current  
 Output current limit setting..... Adjustable to 110% of drive rating  
 Current limit timer..... 0 to 60 seconds or infinite  
 Adjustable max. speed..... From min. speed setting to 120 Hz  
 Adjustable min. speed..... From max. speed setting to 0 Hz  
 Acceleration time ..... To 3,600 seconds to base speed  
 Deceleration time ..... To 3,600 seconds from base speed  
 Breakaway torque time..... 0.0 to 0.5 seconds  
 (1.6 times motor nameplate current)  
 Start voltage..... 0 to 10%  
 DC braking time ..... 0 to 60 seconds  
 DC braking start ..... 0 to maximum frequency  
 DC braking current..... 0 to 50% of rated motor current

## Protections

Low frequency and high frequency warnings ..... 0 to 120 Hz  
 Low current and high current warnings ..... 0 to maximum current  
 Low reference and high reference warnings..... –999,999 to 999,999  
 Low feedback and high feedback warnings..... –999,999 to 999,999  
 Ground fault..... Protected  
 Motor stall ..... Protected  
 Motor overtemperature ..... Protected (predictive motor temp.)  
 Motor condensation ..... Protected (motor preheat circuit)  
 Motor overload ..... Protected (programmable action)  
 Vibration protection..... Protected (programming automated)

## Environmental Limits

Efficiency ..... 97% or greater at full load and nominal motor speed  
 Ambient operating temp. .... 14°F to 113°F (–10°C to 45°C) frames  
 A2–C2; 14°F to 104°F; (–10°C to 40°C) frames D1–E1  
 Humidity ..... < 95%, non-condensing  
 Altitude: maximum without derating ..... 3,300 ft. (1,000 m)  
 Drive / options enclosure(s) ..... NEMA/UL Types 1 or 12; 3R optional

## Control Connections

Follower signal, analog input..... 2; selectable voltage or current,  
 direct and inverse acting  
 Programmable digital inputs..... 6 (2 can be used as digital outputs)  
 Programmable analog outputs..... 1; 0/4 to 20 mA  
 Programmable relay outputs..... 2 standard Form C 240 V AC, 2 A;  
 1 or 3 additional optional  
 Auxiliary voltage..... +24 V DC, maximum 200 mA

## Control Optional

MCB 101 General Purpose I/O..... 3 DI, 2 DO, 2 AI (voltage)  
 and 1 AO (current)  
 MCB 105 Relay Card ..... 3 standard Form C 240 VAC, 2 A  
 MCB 107 24V DC Supply ..... Allows external 24 V DC power to be  
 connected to the TR200 Drive  
 MCB 115 Programmable I/O ..... Available 2nd half of 2009

## Software

Lost speed reference action ..... Selectable to go to a preset speed,  
 max. speed, last speed, stop, turn off, or stop and trip  
 Time delay for lost speed reference action ..... 1 to 99 seconds  
 Adjustable auto restart time delay..... 0 to 600 seconds  
 Automatic restart attempts..... 0 to 20 or infinite  
 Automatic restart time delay ..... 0 to 600 sec. between attempts  
 Relay ON delay and relay OFF delay..... 0 to 600 seconds  
 Maximum number of preset speeds..... 16  
 Maximum number of frequency stepovers..... 4  
 Maximum stepover width ..... 100 Hz  
 Maximum number of accel rates..... 4  
 Maximum number of decel rates..... 4  
 Delayed start ..... 0 to 120 seconds