



Variable Frequency Drives

TR200 Series • Drive your motor for energy savings



Energy efficiency and 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 Performance Climate™ Changer. 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

Just as important as what's in your VFD...



...is what's behind it

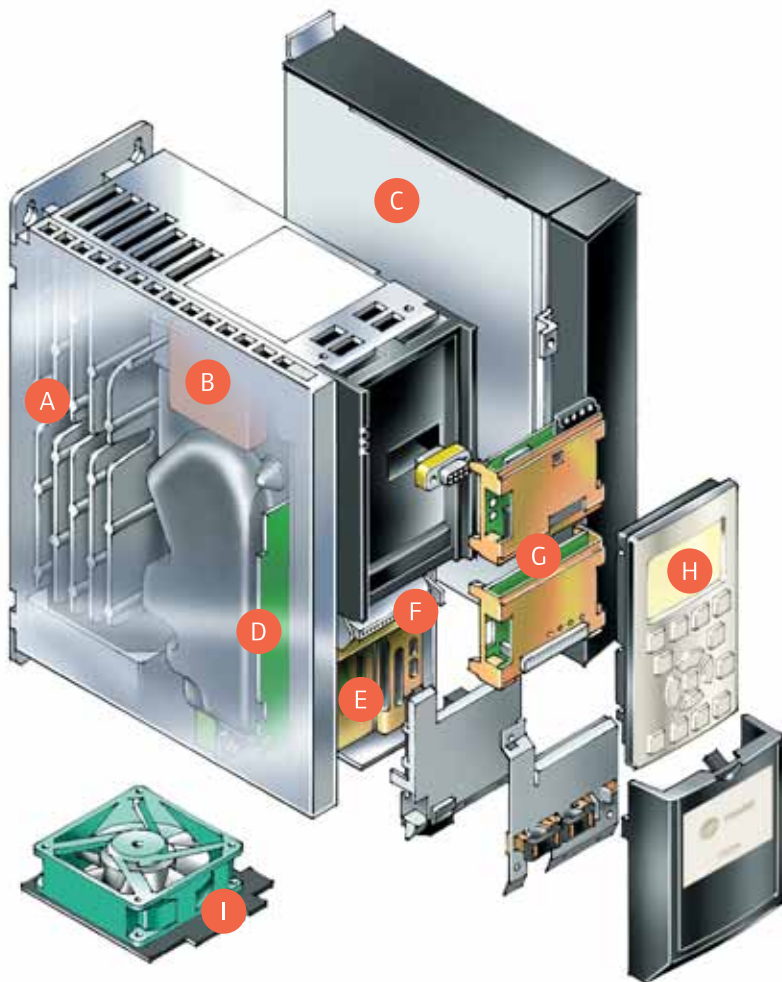
And behind every Trane Variable Frequency Drive you will find a world leader in HVAC equipment, controls and services. Whether pre-installed on Trane equipment, field applied or retrofit, the Trane TR Series VFD comes with the most important feature of all—our proven capabilities throughout the life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

We have a dedicated team of professionals located at over 150 local offices in the U.S. 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.



Ingersoll Rand (NYSE:IR) is a world leader in creating and sustaining safe, comfortable and efficient environments in commercial, residential and industrial markets. Our people and our family of brands—including Club Car®, Hussmann®, Ingersoll Rand®, Schlage®, Thermo King® and Trane®—work together to enhance the quality and comfort of air in homes and buildings, transport and protect food and perishables, secure homes and commercial properties, and increase industrial productivity and efficiency. We are a \$13 billion global business committed to sustainable business practices within our company and for our customers.

TR200 Series



- 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, ± 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	3 universal inputs and 3 universal outputs

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